Practical Psychology

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PRACTICAL PSYCHOLOGY

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PREFACE

So many books on elementary psychology have been published that there hardly seems to be an excuse for another. However, the books that have been published fall into two distinct classes, those designed as college textbooks and those written for the general reader. As a rule, college textbooks in psychology are too difficult for the general reader, who does not have the benefit of the lectures and study which usually go along with the college text. The popular books on psychology, on the other hand, are often written more for the entertainment of the reader than as accurate sources of psychological information. There seems to be a real need for a book on psychology for beginners that incorporates the accuracy and scientific viewpoint of the college text and yet is written in such a way as to be thoroughly understandable by readers who have not the benefit of the college classroom. This book aims to fill that need.

In writing the book the author has had in mind a particular group of readers, serious seekers after knowledge who have not had the background of university instruction. The popularity of University Extension lectures in psychology has demonstrated that such a group exists. The author is indebted to the hundreds of enthusiastic listeners who have formed the audience for extension lectures in psychology at the University of Toronto and throughout the Province of Ontario. This book contains the results of his efforts in such lectures to maintain strictly the scientific point of view in the treatment of general psychology and, at the same time, to make the subject both interesting and practical.

Psychology can have a valuable practical application to the everyday business of living. In the selection of material for this book, one of the main aims was to provide information that could be applied directly by the reader to his own life. There is no royal road to health, wealth, and happiness, and the author does not offer any short cuts to efficiency. However, it is believed that mental health, happiness, and efficiency can be attained by persistent effort; and this book should provide some clues as to how that effort may be directed.

It is hoped that the book may open up avenues of knowledge that the reader may wish to follow. To this end, a list of books for further reading is included. A glossary of psychological terms is also included, as many of the terms in psychology have a precise meaning in distinction to the often loose meaning that they have in everyday conversation. Each chapter is followed by an outline, which should prove of value in reviewing and organizing the material presented in the chapter. A set of review questions is also provided for each chapter. These questions should serve a useful purpose in aiding the student to test his knowledge.

This book is the United States edition of *Elementary Psychology*, which was published by the Life Underwriters Association of Canada. The author is glad to be able to express his thanks to the secretary of that association, Mr. L. W. Dunstall, for his interest and cooperation in the project.

KARL S. BERNHARDT.

UNIVERSITY OF TORONTO,
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Part I

INTRODUCTION

In Part I the reader is introduced to the study of psychology and given some preliminary information about methods of study of this and of other subjects.

Chapter I answers the questions: What is psychology? What is the historical background of modern psychology? What is the subject matter of psychology? What are the methods used in psychology in the collection of information? What are the divisions, or branches, of psychology?

Chapter II offers a set of practical suggestions for reading and study. Planning and scheduling of time, a place conducive to study, and concentrated effort are given as keys to efficiency in study.

Chapter I

AN INTRODUCTION TO THE STUDY OF PSYCHOLOGY

I. WHAT IS PSYCHOLOGY?

PSYCHOLOGY is a science; that is, it studies actual events in a scientific way. Unfortunately the word psychology has been associated in the minds of many people with all kinds of mysterious, occult studies, such as mind reading, thought transference, mental telepathy, character analysis by the stars, handwriting, or the shape of the face or the head. Although psychology is interested in all human activity, such methods as those mentioned above cannot be used because they are beyond the pale of scientific methods.

Man has always been interested in himself, and has always ıttempted to find answers to questions concerning the whys ınd hows of experience and conduct. He has tried to under- ıtand his own impulses, feelings, strivings, and acts. Because f mere curiosity or for more practical reasons, he has ttempted to estimate the ability and personality characteris- cs of himself and of other people. Most people have opin- ons, beliefs, and explanations of the motives that impel dividuals to work or not to work, to fall in love or to hate, buy or not to buy. They find reasons for the differences in bility to learn quickly or slowly, to achieve success or to ail. Psychology is interested in these same problems, but he methods of attack on the problems by scientific psychol- gy are different from the ordinary methods of popular peculation. In order to make its results of real value and nificance, psychology has been forced to adopt scientific

methods of study that are designed to ensure some degree of reliability, accuracy, and dependability.

Psychology, then, can be defined as the scientific study of the activities of individuals. The subject matter is the same as has engaged the mind of man ever since he began to think about himself, but the methods are different. In order to try to make clear what this definition means, let us approach our study from three points of view—first, a study of how psychology developed and took its place as one of the catalogue of sciences; second, a study of the methods employed by modern psychology; and finally, a study of the subject matter of the study.

2. A HISTORICAL INTRODUCTION TO MODERN PSYCHOLOGY

Although psychology as a science has had a comparatively short history, the foundations of psychology are very old. As long as there have been thinking men, there have been attempts to understand the nature of man himself and the meaning of his activities. This interest has had a long history, which we will summarize in five major periods of development. Some understanding of this development should help us to understand and appreciate modern scientific psychology better.

a. The early period of primitive notions.

One of the earliest ideas about the nature of man was that a ghost dwelt in the body, making the body alive and conscious. At death, this ghost withdrew permanently, and during sleep it wandered away, to return again when the person woke up. All bodily activity was activated by this ghost. Not people only, but also plants and animals and even inanimate objects, such as rivers and wind and thunder, were activated by spirits. This idea is called *primitive animism.* We have not completely outgrown this idea; and we find today many indications of this primitive notion in modern thinking.

b. The period of ancient philosophy.

Science and philosophy began when man first attempted to understand the world in terms of what he actually observed, and checked his imagination and sought to explain nature in terms of natural events. About the seventh century B.C., a number of wealthy Greek citizens had time and interest for study and observation. They turned away from politics and civil wars to search for something more permanent and enduring in human life. A group of these early philosophers, called *monists*, sought for an elemental substance to explain the whole universe. Later another group of philosophers, called *pluralists*, looked for not one but a number of such elements to form the basis for their explanations. Later still the *sophists* turned from the broad general interest in the universe as a whole to an interest in man himself. Then in the fourth century B.C. the great Greek philosophers, Plato and Aristotle, produced their systems of thought. Aristotle collected a large mass of observations of physical and biological facts of nature. He wrote a series of books covering the whole range of science and philosophy as then known. In his catalogue of sciences, he included psychology, which he defined as the study of the soul; and for centuries psychology was the study of the soul of man. It included speculations as to the origin and location of this soul, as well as its ultimate destination.

c. The period of authority.

For the first thousand or so years A.D., there was little advance in ideas about man, his nature, and his conduct. Knowledge and education were based on the authority of the church and the ancient Greek philosophers, and there was little original thinking or careful observation. True, there was an interest in the inner experience of man, but this was colored by the mystical attitude of the early religious teachers.

d. The Renaissance and the dawn of science.

Following the long period of the so-called Dark Ages, there was an awakening of interest in natural events. In the fifteenth century there was an emphasis on individual man and his rights. This has been called the period of *humanism.* One phase of this development was the protestant movement in the Christian church. And beginning about the same time and extending for some centuries was the period of great discoveries both in geography and in natural science, and such well-known names as Columbus, Copernicus, Galileo, Newton, Harvey, and Bacon should be mentioned. Their discoveries opened up new worlds of study and research in both physical and biological sciences.

e. The period of modern science.

In the eighteenth and nineteenth centuries, experimental methods demonstrated their great value in widening our knowledge in physics, biology, physiology, and other sciences. Psychology adopted the experimental methods of these other sciences and began to take its place as a scientific discipline. Speculation and armchair philosophizing gave place to measuring and charting the actual activities of man in a systematic way. In 1879, Professor W. Wundt founded in Germany the first psychological laboratory in which experiments were conducted with the behavior of man as the subject matter. The progress of scientific psychology from that time has been both rapid and fruitful.

Psychology is a part of the scientific attempt to understand the world in which we live and ourselves and other people as a part of that world. It is one of the biological sciences, as it is concerned with the activities of living persons. It is closely related also to the social sciences. It has developed from speculation to exact experimentation and observation of things as they occur. But this development is not as yet complete, and modern psychology, although it is

a science, still has some of the remnants of its early philosophical foundations.

3. THE SUBJECT MATTER OF PSYCHOLOGY—WHAT PSYCHOLOGY STUDIES

We have defined psychology as the scientific study of the activities of individuals. The task of psychology is to discover the general laws that explain the behavior of living organisms; and the most important living organism is, of course, man himself. All living is adjusting. The individual is continually subjected to stimulation from his environment and is continually responding to this stimulation and by such responses adjusting to his world. This continual adjustment constitutes the activity of the individual during his lifetime. As psychologists, we are interested in everything that the individual does and experiences; and as scientists, we must adopt the principle that everything has a cause, and that if we search long enough we shall be able to find the reasons for any activity.

The ultimate aim of any science is to be able to predict events with some degree of certainty and thus control those events. Psychology is seeking to discover what particular conditions produce a given type of activity, so that eventually the psychologist will be able to control and direct human activity by controlling these conditions. For example, if we knew the cause of the emotion of fear, we could prevent fear by manipulating the conditions in such a way that the adequate causes of fear would be absent.

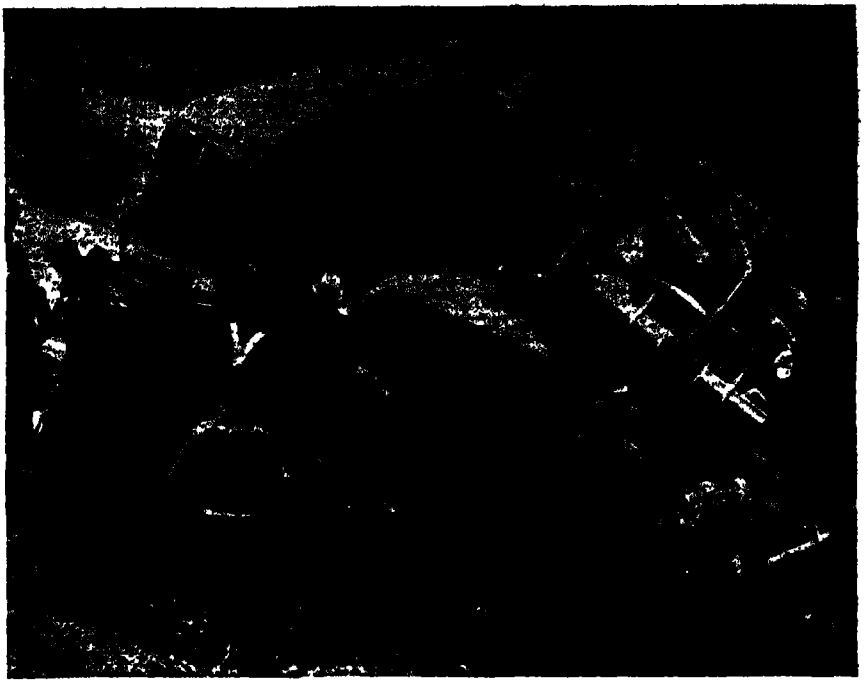
The activity of adult man is very complex and difficult to unravel, but much light can be obtained from a study of the genetic development of activity in the growing child, as well as from the less complex activity of lower animals. Psychology therefore makes use of child and animal subjects at times in its experiments. Our understanding of the normal individual is increased by a study of the abnormal individual, for he may show in somewhat exaggerated form some of the

characteristics of the normal; so psychology studies the abnormal as well as the normal person.

Psychology attempts to discover the source of knowledge, beliefs, and customs, to trace the development of thinking and reasoning, to find the kinds of environmental stimulation that produce certain types of activity, to analyze feelings and emotions, to understand how the crude unorganized activity of the newborn infant becomes systematized into useful forms of adult conduct, to trace the modification of activity in learning, to develop methods for the measurement of the activities and abilities of individuals, and many other similar problems related to human nature and conduct.

4. THE METHODS OF PSYCHOLOGY—HOW INFORMATION IS GATHERED

It is necessary to distinguish popular psychologizing from scientific psychology. We are all interested in human nature and we all study it to a certain extent. Many of us do so in a rather haphazard way, and are influenced by current opinions and prejudices, and accept many popular misconceptions that pass as proved facts, while they are nothing more than the product of someone's fertile imagination circulated as the truth. Our everyday thought is full of opinions, biases, beliefs, and ideas, which, although their origins are lost in the dim past, we are willing to defend vigorously. The author made a collection of some seventy statements about human nature and activity; these he has tried out on some hundreds of university students and has found that the average number of errors made by these students in marking the statements true or false is just over twenty. Scientific psychology must be distinguished from the less accurate body of knowledge about human activity which "everybody knows to be true." The distinguishing characteristic lies in the rigid insistence on scientific methods of gathering information. Scientific



Courtesy National Safety Council
Witnesses to an automobile accident seldom tell the same story in court. This indicates that observations vary greatly.

method is merely the use of procedures that ensure that observations and conclusions are reliable and accurate.

The most accurate method of gathering information employed by the psychologists is the *experimental method.* This is the basic method of all sciences. There is only one way of obtaining information about the activities of individuals and that is to observe these activities. An experiment is a controlled observation; and the controls are such as to ensure the highest possible degree of accuracy.

It is not a very simple matter to ensure that observations of human activities are complete and accurate. It is a well-known fact that the ordinary observer is very inaccurate. Experiments have demonstrated that, even with ordinary precautions, the observations of a number of individuals of the same event vary greatly. The evidence of witnesses of an

automobile accident in police court often indicate this clearly. In demonstrating the inaccuracies of ordinary observation to university classes, the author has staged some little dramatic event, such as a quarrel, before the class and then after the event tested their observation of it. They were asked to answer some simple questions of fact, and to write out a full account of what they saw and heard. No account included all the essential facts; most of the accounts omitted as much as half of the important items; and many of the statements made were erroneous. Accurate observation is difficult and requires as many safeguards as it is possible to arrange.

One technique employed to increase the accuracy of observation in psychological experiments is to train the observers. It has been found that the accuracy of observations can be increased greatly by training. Anyone can observe the activity of a child and come to some conclusions regarding that activity; but if the conclusions are to be of any practical value the observer must be so trained that he will know what to look for, be able to concentrate his observations on the particular feature of the activity selected for study, and be able to record and systematize the information in such a way that the results will be intelligible and useful as well as accurate.

The training of observers must also be such as to remove all prejudice and bias. For example, "everybody" knows that red-haired individuals are likely to be more hot-tempered than others. This "knowledge," or prejudice, makes it impossible for an individual to observe activity in a reliable way; for, when he sees a red-headed person, he expects him to be fiery and ready to fly into a temper at any slight provocation, and this expectation colors all his observations of that individual, so that he either sees what he expects to see or fails to notice that his expectations do not come true. This is the common fallacy of neglecting the negative case. The scientific observer must be trained to

discard all such preconceived notions and observe with an open mind what actually takes place. He must be ready to accept anything that his careful observations indicate, even though the results may seem to be at variance with popular ideas on the subject.

The complexity of human activity is also a source of inaccuracy in observation. The observers of an automobile accident are unable to notice all that takes place. If they concentrate on one feature, another goes unnoticed. In an experiment the conditions of the events are simplified. The important features to be observed are isolated from other factors. In other words, an experiment is an observation of an event that occurs in restricted conditions. The event is staged. Some important feature of the situation is changed in a systematic way and the result of this change is observed, recorded, or measured.

The accuracy of observations is often increased by the use of mechanical devices of various kinds. Apparatus that records the activity of the individual accurately is an aid to reliable observation. Rather than attempt to observe directly the movements of the eyes in reading, for instance, it is much more satisfactory to utilize a moving-picture camera or some other such device which, if properly used, will produce an accurate record of the particular feature of activity with which the experiment is concerned. The moving-picture camera has proved to be of great value in obtaining an accurate record of the behavior of children in some situations. Instruments that record the pulse, respiration, and circulation of the blood during an emotional experience have increased our knowledge of emotions. So, wherever it is appropriate, instruments and recording devices are employed to supplement human observation.

The results of any experiment cannot be accepted as proved facts until the experiment has been repeated and the results have been verified. And when the results of any experiment have been verified by repetition, they are accepted

as true for the particular conditions of the experiment; but when the same general results are obtained under other conditions and by other procedures, a general conclusion or law can be established.

In a psychological experiment the subject may be either the observer himself or some other person or persons. When the observer studies his own activity, it is called *introspection*, and when the subject of the observation is another person it is an *objective* observation. Introspection is a very useful method of gathering information about such activities as thinking, feeling, and emotion; but if the results are to be of any value, the method must be used with great care and with every possible precaution to ensure that such factors as expectation and suggestion are not coloring the results. Objective observation is used wherever possible in place of introspection.

It is not always possible with human subjects to conform to the rules of the scientific experiment. It is impossible in some cases rigidly to control the conditions under which the observations are made, nor is this always desirable. Rigid control of environmental conditions would interfere in some instances with the normal activity of the individual and thus distort the results. In some cases, it might also be detrimental to the individual himself. We cannot interfere too seriously, for example, with the normal development of the child, and, in consequence, have to adopt in such instances what might be considered a less accurate method of securing information. The method used in such cases is the *genetic* method. This method, like the experimental method, is a way of observing and recording events as they take place. The observations are made by trained observers and precautions are taken to ensure accuracy of results. The main difference between this method and the experimental method is that the conditions are not so rigidly controlled and the specific features to be studied are not isolated from others. It is a method of observing human behavior in what might be

called its natural setting. It is the study of development as it occurs. An aspect of the child's development is anticipated, and the development is observed as carefully and accurately as possible without interfering with that development by changing the environmental conditions in any radical way. For example, a child is about to start to walk or to learn to talk, or to acquire a new brother or sister. The genetic method could be used to gain valuable information about such important adjustments by systematic observation and careful recording of what actually happens.

There are also occasions when the use of either the experimental or the genetic method is impossible, and only the *clinical*, or *case-history*, method is feasible. For example, a boy is brought to the juvenile court because he has come into conflict with the law. His case is baffling, so the judge calls in the psychologist for advice. The psychologist sets to work to collect all the information he can about the past history and the present circumstances of the boy, and then tries to decide, from this information and his knowledge of the effect of certain kinds of environment and stimulus conditions, just what factors contributed to the present condition, and what should be done to readjust the boy to life and to social customs. This is the case-history method in action. It is mainly a method for dealing with individual cases, and not primarily a method for gathering information in order to formulate general principles of behavior. It is a method for practical situations and usually so-called problem cases.

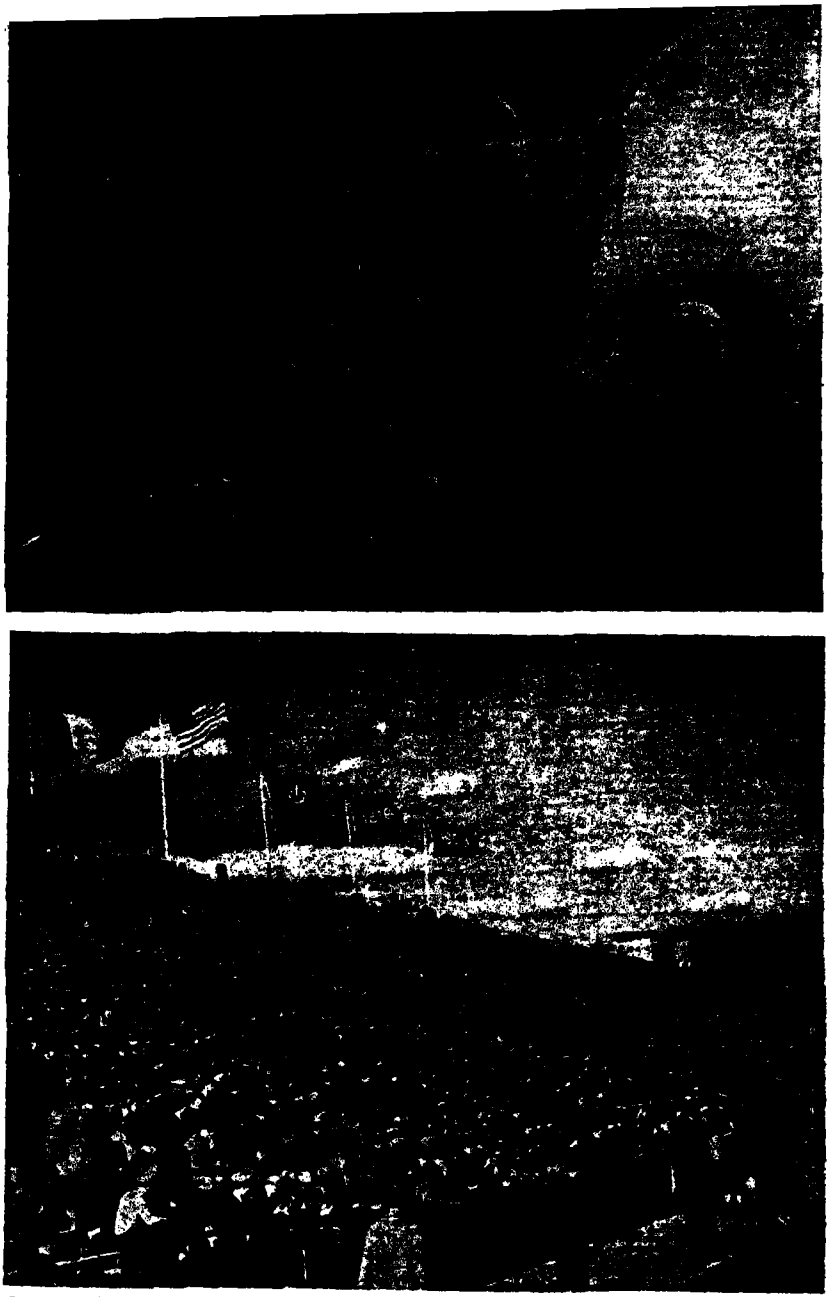
Besides being a valuable method for dealing with individual cases, the case-history method can be used as a source of general information if it is employed with necessary caution and supplemented by the *control-group* method. Let us take an example. Suppose that case histories have been collected on 500 delinquent children and we are interested in finding out some of the contributing causes of delinquency. We can select some factor such as "broken home" (the absence of one parent) and search the 500 case

histories and ascertain how many of the delinquents came from such homes. Let us suppose that we find that 20 per cent of the delinquents came from broken homes. We would be tempted to say then that the broken home is a factor in juvenile delinquency. However, such a conclusion would not be justified until we had examined a control group. The group in this case would consist of another 500 case histories, but this time on children similar to the first group except that they would not be delinquents. Now, if we found that 5 per cent of the control group came from broken homes we would be able to conclude that this factor is important in contributing to delinquency as there is considerable difference between the two groups. In this way, the case-history method can be used as a method of gathering important information when supplemented with the control-group method.

Human nature does not change radically, but our knowledge of human nature is continually changing. So the psychology of today differs from the psychology of yesterday, and we shall probably know more tomorrow than we know today. Common sense, or "what everybody knows," is continually being supplemented and sometimes flatly contradicted as the results of systematic observations and controlled experiments in psychological laboratories, hospitals, schools, factories, and other places become known. New light on the reasons for what we do and think and feel has helped to free us from the entanglements of prejudice and superstition.

5. BRANCHES OR DIVISIONS OF PSYCHOLOGY

There are a number of divisions of modern psychology. In *general psychology* the main interest is in the activities of the normal adult human being. Much important information about human activity is gained from the study of the growing child. This is *genetic* or *child psychology*. There are many problems in which it is impossible to use human subjects and so in some experiments animal subjects are



Courtesy Buffalo Museum of Science and Ewing Galloway

Psychology uses information about primitive civilizations (anthropology), as well as about present social groupings (sociology). What possible psychological problems are indicated in these two pictures?

used. This is *comparative* or *animal psychology*. It has been said that if we are to understand the normal individual thoroughly we must study the abnormal. So the study of the mentally ill, the feeble-minded, and other types of abnormal individuals has added considerably to our knowledge of human activity. This is *abnormal psychology*. And in order to make our knowledge of the individual complete, we must follow him into his social contacts and groupings, and thus we have *social psychology*. Of course, one aim of psychology is to apply the methods, knowledge, and results in practical situations. *Applied psychology* is the attempt to put the psychological facts and principles to work in various phases of human endeavor. One field where psychology has had an important application is that of education; but psychology has also been applied to industry, in advertising, salesmanship, and personnel problems, to the fields of religion, law, and medicine, as well as child training, parent education, and mental hygiene.

Psychology is a biological science; that is, it is one of a body of sciences that study living organisms. It is closely related to physiology, which studies the functions of various organs of the body. It draws on the sciences of anatomy and neurology for basic information regarding the structure of the body and the functioning of the nervous system. Psychology is also intimately related to the social sciences. It uses information from anthropology about primitive civilizations, and from sociology about the present organization of human beings in social groupings.

OUTLINE OF THE CHAPTER

The Study of Psychology

1. Historical development of psychology
 —primitive notions.
 —ancient Greek philosophy.
 —period of authority.

—the dawn of science.
—modern scientific period.

2. Subject matter
—the activities of individuals.

3. Methods
—Experimental—trained observers.
—elimination of bias and prejudice.
—control of experimental conditions.
—verification by repetition.
—exact measurement and recording.
—Genetic—observation of development as it occurs without rigid control of conditions.
—Case-history—reconstruction of the past history of the individual.
—supplemented with control-group method.

4. Divisions of psychology
—General psychology.
—Child or genetic psychology.
—Animal or comparative psychology.
—Abnormal psychology.
—Social psychology.
—Applied psychology.

Review Questions

1. What does it mean to say that psychology is a science?
2. Describe the methods used to gather psychological information.
3. Outline an experiment to test the idea that the color of the hair is related to the personality of the individual.
4. What features of the scientific method could be applied with advantage to daily living?
5. What are the main differences between ancient psychology and modern scientific psychology?
6. What are the divisions of modern psychology?
7. What are the sources of common errors in observation?
8. What are the main values you would expect to gain from a study of psychology?
9. In what ways have your ideas of what psychology is changed during the reading of this chapter?
10. What are the main differences between "popular psychology" and scientific psychology?

Chapter II

EFFICIENCY IN READING AND STUDY

WE ARE supposed to be living in an efficient age. Efficiency is the keynote today in business and industry. But what about our personal habits, such as habits of reading and study? Many, unfortunately, are not very efficient here. There are those who have the idea that all they need to do is to expose themselves to a book or a lecture and the information will somehow soak in. Very often, however, such exposure is a waste of time. The seed falls on stony ground and nothing happens. Something more than mere exposure to knowledge is necessary. The present chapter is designed to indicate what this something more is.

Almost everyone complains about his memory. Of course, he doesn't forget everything, but many important facts seem to be forgotten just when they are needed most. Excuse is often made for poor memories on the ground that memories naturally grow weak after childhood. Professor E. L. Thorndike, by many careful experiments on the relationship between age and learning, has successfully refuted that myth. The adult can learn more quickly than the child if he will set his mind to it. Most people are either too complacent and self-satisfied or else so downright lazy that they do not bother much about trying to improve their learning methods. They have enough knowledge to "get by" with, so why bother learning more? They can remember as well as the next person, so what is the use of trying to improve? Fortunately, the idea that childhood is the only time to learn and that adulthood is the time to use the knowledge gathered earlier is gradually fading away before the zeal and enthusiasm of adult educators. No one is too old to learn, nor does anyone

know so much that he cannot learn more. It is possible to teach old dogs new tricks, and it is possible for all of us to improve our study, reading, and learning habits.

Yes, memory can be improved, and we can learn to be more efficient in our reading and study. Adoption of some of the following suggestions should greatly increase personal efficiency in learning.

I. A TIME FOR STUDY

To be efficient, studying cannot be casual; it must be planned. If, some evening, one could watch a number of students starting to work, he would see most of them spending considerable time in getting started. "I guess I'll work at this—no, maybe it would be better if I started at that essay; but no, I guess that lab report is more urgent; or should I go over that French for tomorrow?" So it goes for some time, with half an hour or more wasted before he settles down to work. What is needed? Simply a study-time

A time schedule written out by a student who works in the daytime and is studying three courses in the evenings.

PLAN FOR WEEK OF OCTOBER 16

To be accomplished:	*Times Available*
Chaps. 1–4 of *Practical Psychology*	Mon. 7:30–10:30
Pages 10–40 of Elementary Spanish	Tues. 8:00– 9:00
Chaps. 2 and 3 of Economics	Wed. 7:30– 9:30
	Fri. 8:00–10:30
	Sat. 4:00– 5:30

Plan:

Mon. 7:30– 8:30: pp. 10–20, Spanish
8:40– 9:30: Chap. 1. Psychology
9:40–10:30: Chap. 2. Economics

Tues. 8:00– 8:30: Review pp. 10–20, Spanish
add pp. 21–25, Spanish
8:35– 9:00: Chap. 2. Psychology

Wed. 7:30– 8:20: Review Chaps. 1 & 2, add Chap. 3, Psychology
8:30– 9:00: pp. 26–30, Spanish
9:05– 9:30: Chap. 3, Economics

Fri. 8:00– 8:45: Review pp. 1–30 and add 31–40, Spanish
8:55– 9:30: Review Chaps. 2 & 3, Economics
9:40–10:30: Review Chaps. 1–3, add Chap. 4, Psychology

Sat. 4:00– 4:40: Review pp. 10–25, Spanish
4:50– 5:30: Review pp. 26–40, Spanish

budget. This is a planned schedule of work put down on paper and followed each day. In this way, no time is wasted in getting started at work. The student knows each time he goes to work what it is he has to do, so he starts to work at once. The person who plans out his study in a systematic way is the person who gets things done and makes progress in his learning, while the individual who waits for "the spirit to move him" often waits a long time and is left behind in the process. This principle of a planned work schedule can have both a short-term and a long-term application. The immediate study jobs can be scheduled weekly, and a long-term program of study and learning can be mapped out in more general terms to cover a period of years. The main thing is to plan your work, schedule your time, and keep to the schedule.

2. A PLACE FOR STUDY

Many people lose out in their study because they have developed bad study habits in terms of the place for study. Sitting or reclining in an easy chair or on a couch with a book in his hands and turning the pages once in a while, the student may think he is studying and learning; but for the most part he is only fooling himself and wasting time. The student who is serious about wanting to learn has a definite place for study—a place that he has prepared and kept for that purpose particularly. It is a place where there are no distractions—no radio, no pictures of his girl friends, no magazines, nothing to suggest anything but work. Here he does nothing but study, and when he is in this place he always works; so that he has built up an association between the place and work, and it is the natural thing for him to start immediately to work whenever he sits in his study place.

3. A STUDY ATTITUDE

Learning is an active process. It is intense effort that educates. A planned work budget, a definite study place,

and an active study attitude go hand in hand. Some details of this study attitude follow.

a. Know what you want to learn.

It is, of course, almost impossible, without a great deal of work, to remember everything that one reads in a book; but it is possible to remember much more than we usually do. As it is impossible and probably not desirable to learn and remember everything, it is necessary to select deliberately what one intends to learn and remember. There is only one way to prevent the trivial and unimportant from destroying the impression of the important, and this is deciding what is worth remembering. Therefore, when you read an article or a book, decide what you want to learn and remember of the material.

b. Make a determined effort to learn.

When you have decided what you want to learn and remember, the next essential is to make a determined effort to learn it and intend to remember it. Much reading is practically useless. We let our eyes run along the lines of print, but we fail to throw any real effort into the activity. Too often the only time we really make an effort to exert ourselves to remember is after we have discovered that we have forgotten, and then it is too late. Many experiments have demonstrated clearly that we learn and remember only when we put forth some effort to do so. It has been shown that, without the conscious intent to learn, individuals required from seven to eleven times as many repetitions of the study material as they did when the intent to learn was present.

A little experiment well worth the trouble involved is to select some aspect of the daily news that interests you and about which you would like to be well informed. Each day, take the attitude of actively intending to learn all that the newspaper has to say about that topic;



Courtesy "The New York Times"
If you read about one topic every day in the paper, you will be actively learning and should in time be well informed on that topic.

read with the idea of discovering something worth learning; and, with all your might, intend to learn it. You will probably be surprised at the result of putting into practice these two important procedures—knowing what you want to learn and making a determined effort to learn it. Such a study attitude may well become habitual.

c. Use the knowledge early and often.

Using knowledge is an aid to remembering it. Many tests with college students have indicated that much of what they hear in lectures and read in books is quickly forgotten. Why? The main reason is that the students make no attempt to recall what they have studied until they are in an examination room. The most common method of study is to read and reread the material; but experiments have shown that a much more efficient way is to read and then attempt to recall what has been read, then reread and again attempt to recall. Using knowledge helps to fix it in the mind. Telling someone the facts you have been reading is an excellent way to clinch them. So, when you have finished reading a section in a book, don't close the book and feel that the job is done; but rather close the book with your finger in the place and try to recite the main points of what you have read and then check your-

self by going back to what you have missed. Then, when you have learned something, use it in some way.

d. Think about what you read.

Many accept as truth anything that they read in a book. Aside from the fact that this is a dangerous procedure, it is inefficient as far as remembering is concerned. One of the very best ways of impressing facts in the memory is to raise questions about them in your mind. Challenge the author in your thoughts. Recall illustrations from your own experience and examine them to see whether they fit into what is written. Compare one author with others. In other words, keep an active, intelligent, questioning attitude as you read; raise questions, create problems, and seek answers. The habit of being curious, asking questions, and looking for answers is invaluable.

e. Rapid reading is more efficient than slow reading.

Rapid reading usually implies greater concentration and more effective learning than slow reading. Fast reading not only saves time but it also increases the efficiency of the retention of the material covered. Tests have shown that speed of reading and degree of comprehension go hand in hand. Nearly everyone can, by a little planned effort, increase his speed of reading by 100 per cent. Verbalizing, or saying the words either aloud or to oneself, decreases the speed of reading enormously. So, if you have the bad habit of saying each word as you read, you should practice reading without doing so. Make a record of the amount read in a given period of time each day and, when beginning to read each day, look up this record and resolve to cover a little more material than you did the day before. You will find that this simple method will produce results in increasing your reading speed, so that eventually you may be able to read two books in the time it now takes you to read one.

f. Clear, definite, concise ideas on any subject are infinitely more valuable than general, hazy, or indefinite knowledge of the subject.

The habit of thinking in concrete, definite terms can be acquired; and the habit of searching for and finding the salient important features of any topic is also possible of attainment. Practice makes perfect here as elsewhere. Find a concrete example for anything you want to understand and remember. Practice picking out the important points in any discussion. Notice carefully the meanings of terms used and practice definiteness in the use of these terms.

g. Mastery of any subject means organization.

One of the simplest ways of organizing any subject is to construct an outline summary of the main topics covered. Examples of outlines are given at the end of each chapter in this book, but it is much better for you to do this organizing for yourself. When a topic has been organized in a logical way, it is much more easily learned and remembered.

A number of other suggestions might be given, but too many might lead to confusion. An interest in personal efficiency in study should generate an experimental attitude, so that through trial other aids to efficiency will be discovered. Check your study habits against the following summary.

OUTLINE OF THE CHAPTER

Principles of Efficient Study

I. Plan your work.
 1. Make a time budget.
 2. Know what you are to study each period.
 3. Don't lose any time getting at it.

II. Have a place for study that is used for study only.
 1. Arrange the study place so that conditions of light, heat, and furniture are conducive to a maximum efficiency.
 2. Use the study place for study only.

3. When not studying leave the study place.
4. Associate work and work only with this study place.

III. Adopt a study attitude.

1. Know what you want to learn.
2. Make a determined effort to learn it.
3. Use your acquired knowledge as early and as often as possible.
4. Think about what you read; challenge the facts given.
5. Learn to read rapidly.
6. Get your information in clear definite terms.
7. Organize your knowledge.

Review Questions

1. Describe five important suggestions for the improvement of study habits and show how they could be applied by yourself.
2. How would you go about increasing the speed of your reading?
3. List any inefficient practices you use in study and indicate how they could be corrected.
4. Why should the arrangement of a separate place for study only help increase efficiency?
5. Record the number of times your mind wandered from the material being studied during an hour study period and suggest how this might be decreased.

Part II

THE ORIGIN AND CONTROL OF HUMAN ACTIVITY

This section of our study deals with the "whys" of human nature and activity. Why do we behave the way we do? What is human nature and how does it develop?

Chapter III provides an answer to such questions as, Which is the more important, heredity or environment? What is the significance of long human infancy? What are the basic processes of development? What are the important stages in human development?

Chapter IV seeks the answer to the general question: What are the main kinds of human motivation?

Chapter V describes the methods used by people to adjust to the frustrations and obstacles in the way of immediate and easy satisfaction of wants and desires.

Chapter VI applies some of our knowledge of human motivation to the very practical problem of influencing other people in ways of thinking and acting.

Chapter VII is another application of facts about human motivation to another practical problem, that of regulating the behavior of young children in home and school and community.

Chapter VIII outlines the affective side of human activity —feelings, emotions, moods, and sentiments. Here there are answers to such questions as, What happens when we are emotionally disturbed? Where do fears come from? How may fears be removed?

Chapter IX suggests some very practical points about emotional control in both child and adult.

Chapter III

DEVELOPMENT AND ADJUSTMENT

THE complex activity of the adult human being is the result of the kind of organism that he possesses and the type of development that has taken place since his beginning as a fertilized ovum. His structure is determined pretty much by hereditary factors; and this structure determines, in part, his activity—but only in part, for everything that the individual experiences and everything that he does leaves him a little different from what he was before. Living is adjusting. The human being, sensitive to happenings in his world, reacts to these events and, reacting, adjusts to changes in his environment. Such adjustments have their effect on his development, determining partly at least the direction, extent, and type of that development.

I. HEREDITY AND ENVIRONMENT

Two extreme views regarding the place of heredity in development have been held. The first is that all development and activity of the individual is determined by heredity. The other view, equally extreme, is that the activities of the individual are wholly determined by environmental conditions. These views are equally impossible. The individual at conception is the product of the union of two cells, one from the father and one from the mother. These cells contain the germs of later development; but, as soon as these cells unite, the influence of environment is felt. If certain normal environmental conditions are absent, the development of the new individual is impossible. Contained in the microscopic *genes* of these germ cells are the potentialities of

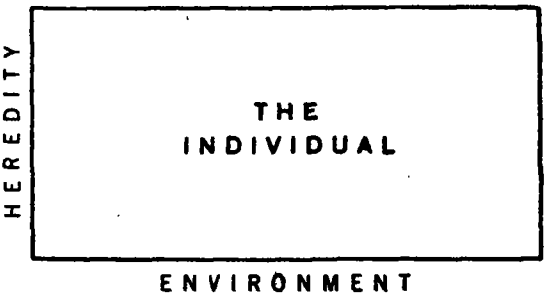


Courtesy "Better Homes and Gardens"
Within three generations in a family there will be certain similarities because of inheritance, such as color of the eyes and general intelligence. But any similarity in traits of personality, character, and temperament will be the result of environment.

later development, but the development requires the influence of a normal stimulating environment. All development depends on both heredity and environment. Some features of this development seem to depend more directly on hereditary factors than on environment. The color of the eyes, the shape of the features, color blindness, and the degree of general intelligence of the individual are determined largely by heredity. However, what are called *personality*, *character*, and *temperament* are more the result of environmental influence.

Psychology neglects to a large extent the influence of heredity, because of the small amount of definite knowledge we have at present on the subject, but also because psycholo-

gists know what a large part the environment plays in the subsequent development of the individual. Once the individual is born, there is nothing that can be done about his heredity; but a great deal can be done about the kind of environmental influences he is to be subjected to during his lifetime. Despite the influence of heredity, almost any kind of development is possible if the appropriate kinds of environmental stimulation are brought to bear on the developing organism. Whether the child becomes delinquent or not, a social person who gets along well with others, or one who is unsocial or antisocial; whether he has a pleasing personality or not; and, in general, what kind of person he turns out to be, is determined to a large extent by the kind of training, education, and experience he has during development.



The individual is the product of his heredity and the environmental influences he has been subjected to.

However, no activity can be explained entirely in terms of native constitution, for all the characteristics of the individual undergo a certain amount of change and development with experience. It is equally true that none of the characteristics of the individual can be explained wholly in terms of environmental influences, because all our reactions to the world are to some extent the function of our native constitution. It may be said therefore, that the developing organism is the product of both heredity and environment and that both of these are essential to the normal growth and development of the individual. However, for our purposes it is possible to neglect almost entirely hereditary factors and concentrate our attention on the development of the individual as it is modified by environmental stimuli.

Someone may ask, what about human instincts? Do we not have to take them into account in this connection? The term *instinct* has had many meanings. In this book we will use the word to refer to unlearned behavior patterns. In this sense the term is for use mainly in animal psychology.

A very good example of instinct is the nest-building behavior of the digger wasp. The mother wasp has never seen a nest built; she has had no training in the activity, no practice, no opportunity for learning. Yet her behavior in building her nest and laying her eggs is exactly similar to that of all other female digger wasps. She cuts a little disk out of the hard crust of the shore, digs a little well a few inches deep; finds a particular kind of inchworm, which she paralyzes by stinging it accurately in a nerve ganglion; and fills her nest with either five or six of these worms, lays her eggs, and closes up the nest. It is a fixed sequence of activities, each one serving as the stimulus for the next. Interrupt the wasp at any stage and she is unable to go on, but must start the process all over again. Much of the complicated performance of the insects is of this nature, made up of unlearned but highly complex activities.

Higher forms of animal life have fewer of these instinctive behavior patterns; and, in the case of man, learning plays so large a part in the development of his behavior patterns that very few such instincts are found. This point will be elaborated further in the next section.

2. THE ORGANIC BACKGROUND OF HUMAN ACTIVITY

A comparative study of the activity of different animal species indicates several interesting facts that may aid us in gaining a perspective on this baffling question of the organic background of behavior. Some of the lower animal forms have a very short infancy, or period of helplessness and dependency. These same animals are dependent on ready-made, or instinctive, forms of activity for all the important functions of their lives; and related to this is the fact that

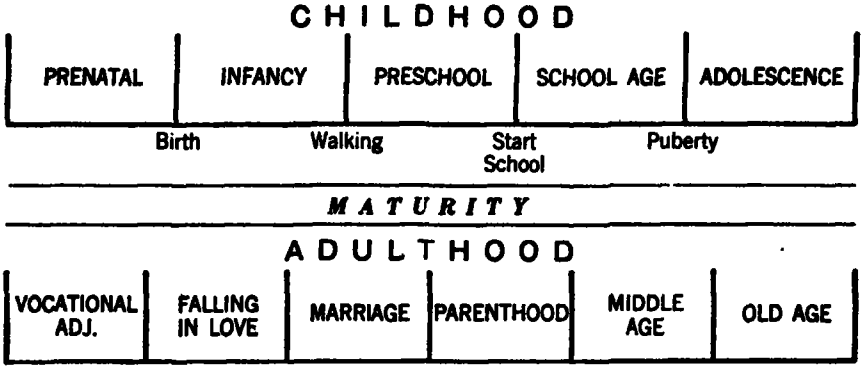
they have a very limited ability to modify or change their activity. When we observe animals higher in the animal scale, we find that this condition is just reversed. The instinctive forms of behavior are fewer in number, the period of infancy is prolonged, and the ability to learn is immensely increased. We conclude, then, that these features of life are in some way closely related. The human infant has the longest infancy; it is dependent on its parents for a considerable period of its life. The human child has very few ready-made or inherited forms of adequate behavior; but it has a great ability to learn, or to modify and change its activity to conform to and take care of the many complex situations in which it is placed. The native forms of behavior, or instincts, are so few in human infants as to be almost negligible. A few reflex activities, such as swallowing, sneezing, and random movements of various kinds, seem to be about the only activities that the child can perform without some amount of learning. The possibilities for learning or acquiring new forms of behavior are almost limitless.

The human child is born with a number of well-defined organic needs or appetites, together with the ability to acquire activities to satisfy these appetites; but instincts, in the sense of unlearned activities, may be neglected in our discussion for all practical purposes. What few ready-made forms of behavior the child has are soon submerged under the more important learned activities, acquired in the child's adjustment to its environment.

3. DEVELOPMENT—MATURATION AND LEARNING

There are two processes of development—maturation and learning. Maturation is the development that occurs through growth of structure and function. This growth is determined mainly by the inherent constitution of the organism. Of course, the individual must have an environment conducive to normal growth; but given this normal environment, the individual develops in terms of a pattern

inherent in the organism itself. That is, a fertilized human ovum will develop into a human infant, not into a rabbit or a monkey. The process of maturation will later produce the ability to walk, run, jump, and perform many activities common to mankind. It will also, later still, bring about a ripening of the reproductive system at a certain stage in development.



Each stage of development from birth to old age has its own problems of adjustment.

The other type of development—learning—goes hand in hand with maturation, and it is difficult at times to separate the effect of the two. Learning is the development and change that takes place when the individual practices an adjustment to some phase of his environment. This type of development is so important that we will study it in detail in a later chapter.

4. A SURVEY OF HUMAN DEVELOPMENT

Development in terms of adjustment to an ever-changing environment can be divided roughly into a number of stages or periods. These stages of development are, of course, artificial; but a scheme of development of this kind is useful in an attempt to understand the whole process. The best guarantee the individual can have of satisfactory adjustment, in any stage of development, is that the individual has

been able to adjust satisfactorily in all previous stages of development. This is a rather important principle, which should become clearer as we describe the various stages and show their interdependence.

a. The prenatal stage.

The first stage of development is that which takes place between conception and birth. In this stage, the individual is protected from external stimulation, and thus development is mostly a matter of maturation. There has been considerable speculation about prenatal influences, and some people believe that the unborn child can be influenced by the mother's attendance at symphonic concerts and the reading of serious books. Other such beliefs include the production of birthmarks by a fright of the mother. It can be said definitely that such types of prenatal influences have no foundation in fact. However, anything that can be carried in the blood stream of the mother can have an effect on the developing but unborn child. This would include malnutrition or good nutrition of the mother, the presence of toxins, and deficiency or excess of glandular secretions.

b. The infancy stage.

When birth occurs, the individual is exposed to a whole new set of environmental stimuli and has a number of important adjustments to make. The human being is born comparatively helpless and immature. He must be cared for by someone else, or he would die. But with birth and these new environmental stimuli, he begins to learn; and what he learns as an infant is important because it is the foundation for later learning. His immaturity is the basis for his learning, for he has few set behavior patterns. He is plastic and can modify his activity to fit into almost any kind of situation. Slowly but surely he discovers meaning in the buzzing confusion into which he was born. He becomes vaguely aware, for instance, that people are important to him; for he soon discovers that

whenever his basic needs are satisfied some other person is present to provide him with food and make him comfortable. At first he may cry when he is picked up, but soon he learns to cry in order to be picked up. Between his long periods of sleep he is learning about the world. His adjustment as an infant is important mainly because it comes first in the developmental sequence and is therefore the foundation on which later adjustments are built.

c. The preschool stage.

The infancy period ends and the preschool stage begins when the child has acquired the ability to get around in his environment for himself—when he has learned to walk. Now, instead of an attractive ornament that "stays put," we have a child who can and does move around, and who can thus get into trouble and quite literally get "under foot." When the child learns to move around in his world for himself, there is a whole new set of adjustments he must make. There are, he finds, things that he mustn't touch. There are things that are hard or hot or cold. There is much to explore and much to learn. At the beginning of this period, the child can make a few sounds, some of which may be taken by fond parents to have meaning; while a few short years later he will have mastered a language with hundreds of words, which he can use to communicate his thoughts and desires. He learns to feed himself, to wash himself, to take care of his toilet needs, to dress and undress, and to perform literally hundreds of other important activities. He learns to adjust to other people, to play with other children, and to get along with his parents and other adults. He has learned to control his emotional expression fairly well—has discarded temper tantrums and crying as methods of getting what he wants. This is one of the most important periods of development, because what the child learns or fails to learn during this stage will greatly influence his later adjustments. The last few decades have demonstrated the value of nursery





From "Infant Care," Children's Bureau, U. S. Department of Labor, and Philip Gendreau

In the development of the infant to old age, the individual passes through several stages of adjustment. His success in adjusting to one period will make the next stage that much easier.

schools for the preschool child, in which he can be helped and guided in these important adjustments.

d. The school-age period.

When the child has reached the school age prevalent in his district, he leaves the comparatively sheltered environment of his home and enters a school, where another whole new set of adjustments must be made. He finds that he is now one of a group, that the discipline is different from that to which he has been accustomed, that there are some things that he just must do whether he wants to or not. This is often a rather critical time in the development of the child, and some children experience difficulty in adjustment. But adjustment in this new environment, with its own peculiar problems, is helped when the child has been able to make satisfactory adjustments previously. This, like the preceding period, is one of great progress in learning, not just in terms of the acquisition of academic knowledge and skills, but also in social and emotional development.

e. The period of adolescence.

Many people think that adolescence is necessarily a period of peculiar strain and stress, a period of difficult adjustment. This is sometimes true, but it need not be so, if the previous years are well used in adjusting to the demands made then. Adolescence starts when the reproductive system begins to mature and the secondary sexual characteristics begin to appear. Now the sex appetite becomes active, and an interest in the opposite sex becomes prominent. This, of course, requires adjustments on the part of the individual, who is helped in making them if during the early stages there has been no artificial separation of the sexes. On the other hand, he is hindered in making this adjustment if, during the preschool and school-age periods, he has been denied the chance to play and associate with the opposite sex.

The period of adolescence normally is characterized also by a mild conflict, in which the individual at times wants to be treated like an adult and at times wants the security and protection of childhood. He is approaching the period of responsibility, when he will have to make his own decisions and can no longer be dependent on other people. Adolescence ends and adulthood begins when the individual has achieved a maturity in social and emotional as well as in intellectual and physical characteristics. That is, he is an adult when he is able to run his own life satisfactorily, to fit into a world of responsibility, and to live happily and effectually with other people.

f. Vocational adjustment.

The stage of vocational adjustment usually overlaps with some of the previous stages, as the child may begin to think about and study about the world of work and start to make decisions as to where he can fit into it. This is an important adjustment, which depends on other adjustments for its success; for the acquisition of habits of work, the development of attitudes toward work, and the knowledge of kinds of work can take place early in development. This adjustment is important enough to be discussed in more detail in a later chapter.

g. Heterosexual adjustment.

Heterosexual adjustment is adjustment to the opposite sex and especially to some particular member of it. It is an adjustment that depends on many features of early development, such as the type of early sex education received. It is a phase of large adjustment to people in general, which will be discussed in a later chapter.

h. Marital adjustment.

Following the narrowing of the interests and affections of the individual to one person of the opposite sex, the usual

result is marriage. This is an adjustment that is far from being simple and easy. A conservative estimate would indicate that about one out of every three persons fails to make a satisfactory adjustment here. The factors contributing to success or failure in marriage have been brought to light by a number of carefully conducted studies. These studies indicate that features of early development, such as the type of home training, the chances for social adjustment, the kind of sex education, and many others play their part in making this adjustment successful or the reverse. This is another example of the general principle we have been emphasizing—that successful adjustment at any stage of development depends, at least in part, on the history of past successes and failures.

i. Parental adjustment.

When the individual becomes a parent, there is again a whole new set of adjustments to make. Being a good parent is not easy. In a later chapter some suggestions are offered for the guidance and regulation of child behavior, which should be of assistance to a parent in making these adjustments.

j. The period of middle age.

The period of middle age is traditionally one of conservatism. The individual has met and experienced most of the dramatic events of an ordinary normal life and has little that is new or different to look forward to. He must learn to adjust to this situation. That this adjustment is not easy is indicated by the large number of middle-aged people who have nervous breakdowns and other forms of mental illness.

k. The period of old age.

This is the period of gradual decline in ability and activity of the individual. He usually has to adjust to a restricted kind of activity, often stop working, and in many ways reorder his life.

In this section we have traced some of the more important periods of development in terms of adjustment. We have shown how each stage of development is dependent on the preceding stage. We have indicated that each adjustment of the individual has a double importance—it is important both for the present occasion and also because it helps to determine later adjustments. We would not, however, like to give the impression that a person is of necessity doomed to failure in adjustment because of previous failures, as it is possible through practice and reeducation to break away from one's past and make new and successful adjustments in spite of past failures. This, however, requires great effort and determination on the part of the individual.

OUTLINE OF THE CHAPTER

Development and Adjustment

Heredity and environment—their relative importance.
- The activity of the individual is the product of their combined influence.

The organic background of activity—
- The significance of human infancy.
- Very few human instincts.
- Potentialities for learning and development.

Development—
- Maturation—development through growth.
- Learning—development through practice.

Stages in human development—
- The prenatal stage.
- The infancy stage.
- The preschool stage.
- The school-age period.
- Adolescence.
- Vocational adjustment.
- Heterosexual adjustment.
- Marital adjustment.
- Parental adjustment.
- Period of middle age.
- Period of old age.

Review Questions

1. Write a note on the relative importance of heredity and environment.
2. Comment on the statement: "The best guarantee of successful adjustment in any stage of development is that the individual has been able to adjust satisfactorily in all previous stages of development."
3. How would you define instinct? Is there an instinct to fight? If so, give examples.
4. Why are the periods of infancy and the preschool child considered to be so important in human development?
5. Describe some of the characteristic problems of adolescence and indicate how some might have been prevented by previous learning.
6. Why is the period of middle age usually characterized by conservatism?
7. Show how early adjustments or failure to adjust could have an effect on marital adjustment.
8. Defend or criticize the statement: "No two individuals have exactly the same environment."
9. What is the importance of a long period of infancy in the human race?
10. Describe any further periods of adjustment or major adjustments common to most human beings other than those described in the text.

Chapter IV HUMAN MOTIVATION

I. INTRODUCTORY STATEMENT

THERE is a reason for everything we do. All human activity has some cause. It is often difficult to find this cause or to decide just which of the thousands of possible influences determined any particular action. Our knowledge of human activity will have to advance considerably before the ultimate aim of psychology is attained, namely, to be able to predict what particular response will follow a particular stimulus. At present we can do this only in very general terms. To be able to predict what success an individual will achieve in life or in any occupation, we need to know something about his abilities, his past experience, and his motivation. To be able to predict what a person will do in any given situation, we need to know something about his established habits, his organic condition, and what he happens to be doing at that time. Before we attempt to answer this very complicated question about the prediction of particular responses, it is necessary to know something about the kinds of influences that affect and direct human activity. We will attack first the more general question as to what directing influences help to determine the individual's activity.

In general, everybody does what he does at any particular moment because he wants to. The martyr goes to the burning stake because he desires to do just that, rather than anything else that would relieve him from such action. The problem in motivation is twofold: (1) to outline the kinds of influences that direct activity and (2) to try to determine which of these influences is active in a given situation. This

is not easy. All casual relations in human activity are rather obscure, and it is hardly ever possible to carry our search to an ultimate conclusion in particular cases; but it is possible to outline some of the more basic reasons for human conduct.

Human beings have very few ready-made forms of behavior, few instincts or unlearned activities. Rather, we find that almost all human activities undergo modification or change during the lifetime of the individual. All human activity is subject to learning. This learning itself has a cause or is motivated by something. Man has a large number of needs or requirements that initiate behavior, so our first task in this chapter will be to outline these basic needs or organic requirements.

2. THE ORGANIC NEEDS OR APPETITES

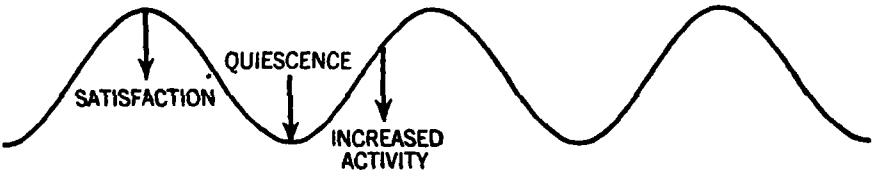
Man is so constructed that he requires certain things in order that he may keep living. He is also so constituted that these needs make themselves felt in such a way as to initiate activity that will eventually satisfy them. He needs air to breathe, food to eat, liquid to drink, rest from activity, sleep, a changing environment, the elimination of waste products, and sexual expression. These are all basic organic needs, which demand periodic or continual satisfaction. They are motives or directing influences, because they initiate and sustain activity and also direct that activity until the activity finally ends in a satisfaction of the felt need. We will call these *appetites*.

It is characteristic of all appetites that they produce activity. A hungry person is a restless one and this restlessness is directed usually toward the removal of the organic state involved. Not only is an appetite productive of activity, but it produces the kind of activity that habitually results in the satisfaction of the appetite. Appetites are cyclic or rhythmic in their action. They demand satisfaction; then, when this is achieved, they lapse into quiescence for a time, only to return, after a period, to the active state again. An

unsatisfied appetite is usually an unpleasant condition, and as the satisfaction is delayed it becomes more and more unpleasant and productive of further activity.

a. The appetite of hunger.

The need for food is so obvious and everyday an occurrence that not much need be said about it. The basis of this appetite is found in the organic sensations arising from an emptied stomach. The ramifications of this appetite into all phases of life are very extensive. All other activities must give way to the satisfaction of this basic need. Man will go



The cycles of hunger have a three-way rhythm. They demand satisfaction, become quiet for a time, and then return to the active state again, ready to renew the cycle.

to great lengths in his behavior to satisfy his hunger. Even here, habit or custom plays its part; we eat three or four meals a day from habit rather than from need. The cycles of hunger in the young infant, occurring every three or four hours, are modified to fit in with the routine of the household; and, just as soon as possible, night feeding is done away with. Before long, the child's appetite is made to conform with the daily routine of the household. The appetite of hunger may be more intelligently selective than we often give it credit for being. Animals have demonstrated in experiments that, when they are given a free choice, they are capable of choosing the kinds of food that are best suited for their requirements. Even human children, when they are not hampered by social conventions, usage, and suggestion, have shown that their unmodified appetites are equal to the task of selecting the food that is most suitable for their growth and

development, and even of selecting the kinds of food that are effective in remedying a condition of active rickets. Very early in life, we begin acquiring likes and dislikes for certain kinds of foods, often because of social suggestion, so that the appetite of hunger loses its trustworthiness as a selector of what is best for us.

A great part of the life of man is spent in activity that is primarily motivated by the need for food. Civilization, social custom, and the habits acquired during a lifetime obscure this fact. One of the surest and most dependable forms of human motivation is the basic appetite of hunger. Habit and experience complicate the picture considerably, so that man's appetite must be satisfied in a particular way and with particular foods; but the strength of the appetite as a form of motivation remains unchanged. One complication is the presence of imagination of future needs. Man's activity is motivated not only by the present need of food to satisfy hunger, but also by needs of the future. One of the most important foundations of happiness, contentment, and mental health is a feeling of security in terms of the basic organic needs. When this security is threatened, man is motivated in many ways. He may work harder, he may become a radical in thought, he may try to lay the blame on others, or he may do any one of a great number of things, depending on his training and experience.

b. The appetite of thirst.

Thirst is another organic need that motivates activity. The stimulus for this activity is a definite need for moisture, which is indicated most acutely by sensations from the throat region. In its influence and functioning, thirst is very much like hunger. These basic appetites are most apparent when they are denied satisfaction. In such situations individuals are likely to go to almost any length to achieve the satisfaction of their basic appetites; and the customs and habits of a lifetime may be discarded if these interfere with this result.

c. The appetite of sex.

The sex appetite is so important in life that Freud and other psychoanalysts have considered it the one and only important human motive. Most psychologists are of the opinion that this is an exaggeration. Hunger, thirst, and other appetites still to be mentioned are equally insistent and probably equally important as motives. Sex is not all of life, by any means; nor is it all of the marital relationship. The delay and thwarting of the sex appetite by economic and social taboos have forced this appetite to find other outlets in behavior. The secrecy, shame, and suggestions of indecency connected with the sex activity provide the soil for perversions of habits and thoughts that originate from an entirely natural and decent, but persistent, appetite. Better management and understanding of the sex appetite is required, as this appetite is in itself no more shameful or indecent and probably no more powerful than any of the other appetites.

As is true of the appetite of hunger, the appetite of sex is overlaid by many social customs and habits. Whether the sex appetite finds its outlet in companionship with the opposite sex, in reading, in the enjoyment of art, or the production of art or literature, the strength of the appetite as a director of behavior is undeniable. Planning for the future complicates the situation, so that the direct satisfaction of the appetite may be subordinated to indirect forms of satisfaction. In modern society, the sex appetite motivates a man to save his money so that he may finally find the satisfaction demanded in a way that is socially acceptable.

d. The appetite for rest and sleep.

Continuous activity without intervals of rest would result in death. The appetite for rest and sleep is, then, a protective function. Rest after activity is not only necessary but satisfying. Sleep is a condition brought about by the reduction of stimuli or by neglecting to respond to stimuli.

e. The appetite for change or variety.

Just as there is an appetite for rest and sleep, so there is also an appetite for activity, for change, for different stimuli. Watch a four-year-old. He hasn't learned to deny this appetite as he will later. He seems unable to attend to anything for any length of time. True, the forms of play are acquired, but they are acquired because of this basic need for activity, for change. Work also is an activity, but work is different from play. Play is activity for the sake of the activity itself, while work is activity for the sake of something else. Margaret makes mud pies while mother makes apple pies. Mother makes pies so that the family may eat. Margie may leave her mud pies half made if some more interesting activity presents itself, but mother must keep on at her pie making until the pies are ready to eat. The consequences of her activity make no difference to Margaret, but the result of the pie making is very much the concern of Margie's mother.

Play is spontaneous, but so is all activity until it is hampered and restricted by social custom and habit. This appetite for change and activity might be called curiosity—the desire to discover, to participate; and play is often the play of imagination. The stern realities of life and living soon put a damper on curiosity and imagination. But play is not by any means useless. Through play, the child learns, he finds out things, he makes discoveries, he tries himself out.

Even when the child grows up and has to conform to the stern dictates of social conventions, the workings of this appetite are still apparent. Work may be play. Two men will do more work together than they would separately. Factory girls will accomplish more to the accompaniment of the music of a phonograph than they would without it. Life hates monotony. Modern industry, with its super-efficiency and specialization, denies the satisfaction of this basic appetite, breeds discontent and boredom, and makes of the daily activity of millions work indeed. The appetite for

change and play cannot be denied. The feverish search for pleasure and recreation of the present day is man's reaction to the drudgery of uninteresting work; but man's training has been mostly a preparation for work and so he often fails to find the required satisfaction in play.

A great part of the dissatisfaction and vague general unrest may be traced to the inability of individuals to find a satisfaction for the basic need for change. When an appetite is denied satisfaction in the usual or natural way, that satisfaction is sought in some indirect way. Man will go to almost any length to find an outlet for his need for interesting and pleasurable activity. Mental instability and even insanity seem to be increasing at an alarming rate. This may be due to the unsatisfied desire for activity that is not monotonous and uninteresting. Try the experiment of engaging in some very dull and uninteresting and meaningless activity, such as adding two and two over and over again for some time, and see how long you can endure it. Man requires variety in activity.

f. Other appetites.

There are other basic needs, which we will content ourselves with just mentioning. These appetites also demand satisfaction and produce activity and direct that activity in specific directions. The elimination of waste products from the body, the appetite for air to breathe, the need of an intermediate temperature producing the urge to secure warmth, when cold, and to secure coolness, when overheated—these are persistent needs.

Men in general rarely understand the forces that determine their conduct. These basic needs or appetites are the basis of a great part of the activities of the individual. The feeling of security, which is the foundation of a mentally healthy individual, comes when he anticipates no obstacles in the way of achieving a regular satisfaction of these appetites.

Some writers assume that the main goal of human conduct is the attainment of a condition of organic comfort and the avoidance of organic distress. Whether this extreme position is justified or not, it is certainly true that these organic needs dictate much of what we do and direct most of our activities. Innumerable habits are formed because of these insistent organic needs; in fact, these appetites are at the foundation of most of the learning activity of the individual.

3. EMOTIONS AS MOTIVES

Another kind of motive is that of the emotions. In a later chapter, we will discuss in some detail the emotions, so it is necessary at this time merely to indicate how emotional experiences direct activity. When he is under the influence of a fear, a person may do many things that he would not do normally. That fear motivated human behavior has long been recognized. Parents have used fear to direct the conduct of their children. The state, the church, and other organizations have from time to time used fear to produce a desired form of behavior. Anger motivates individuals to fight, to attack, and to say things that would be beneath their dignity if they were not dominated by this emotion. Besides the intense emotions of fear and anger, the milder forms of emotion—sentiments and moods—dictate the course of action to be followed by the individual.

4. FEELINGS AND ATTITUDES AS MOTIVES

Every experience that the individual has and every activity in which he engages is evaluated by him as being pleasant or unpleasant. That is, there is a feeling tone scale ranging from extreme pleasantness to extreme unpleasantness, and every experience can be located somewhere on this scale. When an experience is evaluated as pleasant, the individual has an attitude of approach to that experience; that is, he tends to prolong and continue the activity. When,



Courtesy Moses Brown School, Providence, R. I.
The strong desire to excel, succeed, or win out over others is probably trained into us by custom or education. It is a universal tendency.

however, he evaluates the experience as unpleasant, he has an attitude of withdrawal; that is, he tends to discontinue that experience. So the ever-present feeling tones of pleasantness or unpleasantness, with their accompanying attitudes of approach and withdrawal, are important human motives.

5. THE SOCIAL MOTIVES

The whole story of human motivation is not told in terms of organic needs, emotions, and feelings. If, for instance, the only motives of human conduct were the organic needs, we would be able to satisfy hunger and the other appetites in a much more simple manner than we do at present.

The whole picture is complicated by the fact that man

is predominantly a social being. This social existence has produced in man certain characteristic attitudes or tendencies. Whether it is due to inborn nature, or, as is more likely, trained into us by social custom and education, there is a universal tendency to strive to excel and succeed, to win out ahead of others, or to overcome obstruction or difficulty. This tendency, which we will name *self-assertion*, can be traced through a great many activities of the individual. Obstruction is met with increased activity, difficulties call for more energy, projects must be carried through to a successful completion, rivals must be beaten, or success must be achieved for its own sake. The so-called fighting instinct is still another phase of this same tendency. Success has become a human goal; and, if it cannot be attained in one way, it must be in another.

Strange as it may sound, there is also the tendency present in human beings to submit, to give in, to subordinate themselves to other authorities. This tendency we will call *self-submission*, or *self-negation*. Forced submission to others, which is common enough but hardly pleasant, is not what we mean by self-submission. There is a submission that is satisfying. There are situations that are obviously beyond our own powers to cope with, and in these situations submission to some person, or to some idea, or to some system of religion or to the laws of society seems to be the natural and satisfying course. The child is submissive to the adult; the adult is submissive to the wiser or more influential person or to groups of individuals or to the representatives of constituted authority. Admiration, hero worship, reverence, and awe are all indications of willing and satisfying submission. Submission to a protective authority or a power greater than ourselves may be conducive to a feeling of security and permanence. We like to have a boss, as well as to boss others.

A standard of mental health is a proper balance between these self-tendencies. There are occasions when self-assertion

is called for, and there are also situations when the individual's interests are best served by submission. Social intercourse is possible only on the basis of give-and-take, of assertion and submission. So, the socially well-adjusted individual is the one who at times is assertive and at other times is submissive.

Another rather powerful kind of social motivation is found in our ideas of what other people think of us. If not in all people, at least in most, there is a strong desire to be well thought of, to achieve social approval. The almost universal attempt to "keep up with the Joneses" is one very common phase of this desire for social approval. Sometimes this desire works in a very direct way, but more often its machinations are indirect and perhaps obscure even to the person concerned. The child seeks approval by his showing off before strangers and family. "Watch me" is the characteristic phrase of children in one stage of their development. The young man strives to appear strong, skillful, clever, smart, grown-up, sophisticated, or bad, depending on the group to which he belongs. The almost universal attempt to improve on nature by all kinds of beauty tricks is one of the most common manifestations of the desire for social approval in the young lady. The adult also strives to attain some degrees of social approval by personal appearance, clothes, house, car, amount of life insurance, social connections, wealth, success in business, politics, athletics, philanthropy; or by wit, generosity, or even assumed peculiarities and eccentricities. If it is not possible to attain satisfaction for this desire for social approval in one way, then some other means may be adopted. Although this desire to be well thought of is really one manifestation of self-assertion, it is so prominent in human activity that it merits separate mention.

Just as we go to great lengths to attain satisfaction for the desire for social approval, so we will do almost anything to avoid social disapproval. Social ostracism is the powerful

weapon society wields to regiment its members, for very few people can stand against the disapproval of others.

Everyone desires to feel that he is secure socially. He wants to feel that he "belongs," that he is liked, accepted, and "at home" in his world. He strives for status, a "place in the sun." He learned early in his development that other people are important to him; and, whether he will admit it or not, this idea continues with him all his life. It dictates and directs a great part of his activity. If his social security is threatened, he will go to great lengths to build it up again. His mental health depends on this feeling of "belonging" in his world. So, the social motives are very powerful in directing human activity.

6. OTHER HUMAN MOTIVES

Our account of human motivation is not complete, and cannot be, until we learn more about human activity than we have been able to up to this time. There is still much to be discovered. There is, however, one general feature of activity that we should mention here. Once an activity is started, there is a tendency for that activity to go on to completion. Experiments with children have shown that to break off an activity before it is completed is to produce a slight strain that directs the individual's behavior in such a way that he will have a tendency to return to that activity and finish it as soon as opportunity allows. An activity in progress, then, seems to carry sufficient motivation within itself to carry it to some kind of completion.

Habits may also be motives. That is, once a habit has been established, it becomes almost automatic and requires only a stimulus to set it in action. Every individual has habitual modes of reaction, of thought, and of belief. These ways of thinking and acting are, of course, the lines of least resistance, and therefore are the ways in which the individual usually responds to any situation. It usually takes some rather unusual situation or some rather strong motivating

factor to divert the individual's action from these habitual channels.

In any account of human motivation, the appetites or organic needs are basic but not the whole story, because man is predominantly a social being and is forced to live in a social environment; and his behavior has to fit into the patterns of activity that society dictates. The striving for self-assertion and the desire to be well thought of direct behavior, but again the direction of the activity is determined partly also by the customs of the group.

The emotions are powerful influences on the course of behavior, but emotional expression is modified by social pressure.

Fixed ideas, opinions, beliefs, and habits of thought must also be considered in any attempt to account for the varieties of human conduct.

Besides all these, there is also the great complexity of stimuli in any situation. These stimuli are always changing, thus changing the situation and the individual's response to it. We act differently in different situations, the same stimulus producing different responses, depending on whether we are in church or at the club or at school or at home or in someone else's home. Thus, the objective environment produces a "set," or readiness to respond in a particular way. It is very difficult to predict what an individual will do in any given situation.

Perhaps the conditions that determine an individual's response are so complex and elusive that we shall be unable to tell exactly what a person will do at any given time; but the more we know about the individual and his past habits and about the stimuli that are present, the more accurate will our predictions become. However, the situation is not by any means hopeless, because we do know something about the dependable motives, appetites, emotions, and social forces, and we can be fairly sure that the individual will act in such a way as to satisfy these basic needs. If our task is to

influence some other person, we can be reasonably sure that an appeal to these basic needs will meet with some amount of success.

OUTLINE OF THE CHAPTER

Human Motivation

1. The appetites
 —hunger.
 —thirst.
 —rest and sleep.
 —change or variety.
 —sex.
 —general physical well-being
2. The emotions
 —fear.
 —anger.
3. Feelings and attitudes
 —pleasantness and approach.
 —unpleasantness and withdrawal.
4. Social motives
 —self-assertion and self-submission.
 —social approval and disapproval.
 —social security.
5. Other motives
 —activity in progress.
 —habits.
 —objective environment.

Review Questions

1. Discuss the statement: "All human activity is caused by something."
2. Make an outline of the important classes of human motives.
3. Show how a habit can function as a motive.
4. The desire for social approval is a powerful human motive. Discuss this statement in terms of a plan for selling any commodity.
5. Show how a knowledge of human motivation could be of use in selling life insurance.

6. Make a list of activities in a typical day of your life which are primarily motivated by organic needs.
7. Show how learning to satisfy the appetites is influenced by social custom.
8. List examples from your own experience of activity motivated by social approval.
9. Why should fear and anger be considered motives?
10. Select five activities in which you have engaged recently and try to determine what has motivated these activities.

Chapter V

MECHANISMS OF ADJUSTMENT TO FRUSTRATION

1. INTRODUCTORY STATEMENT

THE account of human motivation given in the preceding chapter would not be complete if we did not include a discussion of the indirect ways in which urges and impulses and appetites may find expression and satisfaction. Individuals are active primarily as a means of satisfying these cravings and wants; and these motives call forth persistent activity until some degree of satisfaction is attained. A need unsatisfied is unpleasant, while a need satisfied is productive of pleasure. Activity is, in general, aroused by conditions that persist until some adjustment is made that relieves or removes the motivating tensions. Each specific motive has a life history. It started somewhere and somehow and persists until the individual makes some kind of adequate adjustment to it.

Because of the predominantly social environment in which we live, there are always situations arising in which our wants, desires, urges, and impulses have to be denied the satisfaction that they normally crave. To put this differently, adjustment to a motivating situation is not always possible in a direct way, but must take place indirectly. The demands of one person's life frequently lead to the hampering of the demands and satisfactions of other people.

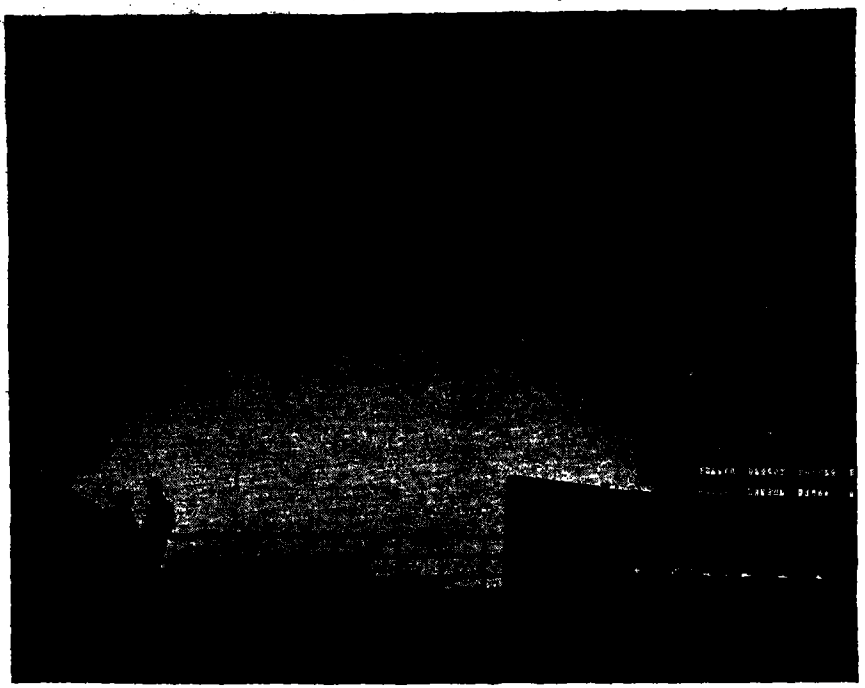
Our natural tendencies are continually running counter to the customs and traditions of the society to which we belong. Conflict between our urges and the possibility of their satisfaction is then a daily occurrence in our lives. What happens when there is such a conflict? Do our appetites just vanish when they are denied their normal satisfaction? It is characteristic of motives that they must have some form

of expression in activity. In other words, a motive is a condition to which the individual must adjust himself. Whether this adjustment is the usual one or not depends upon circumstances. Indirect adjustment to motivating situations is then very important, for much of the individual's adjustment to life is of this nature. If this adjustment to conflict, difficulties, and obstacles is a happy one, so much the better for the individual and society in general; but, if the reverse is true, both the individual and society must suffer in consequence.

Most of the adjustments we make to life and to the ever-present motivating situations are learned. We build up habits of adjusting, habits of achieving satisfaction and pleasure. These habits of adjusting to difficulties may be general rather than specific to definite situations. The individual may have a characteristic way of adjusting to all difficulty, by giving in to defeat or by rationalization or by any one of a large number of other possible adjustment habits. Our happiness and peace of mind, as well as our success in social and vocational situations, depend to a considerable extent on these habits of adjustment.

There are two main kinds of adjustment to difficulty, which we will call *overt* and *covert*. The overt form of adjustment is more primitive. It takes the form of attack and combat. When the young child's toy will not work, the child may adjust to this difficulty by ruthless attack on the thing that is thwarting his pleasure and destroy the toy. Overt or immediate adjustment of this kind is rarely thought out, and is often irrational, impulsive, destructive, and socially unacceptable. One nation is thwarted by another; the result is war. One individual finds another in the path to success, with the result that he knocks him down to get him out of the way.

The covert or inner adjustment is much more common in our modern civilization and is much more interesting, especially to the psychologist. Here the battle is waged within



Courtesy Tennessee Valley Authority

By damming up a stream of water, we create a source of power. Interfering with a human motive makes it stronger and, like the water, it will break through somewhere.

the individual; and, as the conflict is within, the adjustment is usually made in some indirect way. A hungry man stands before the bakery window. Shall he smash the window and snatch the bread, or shall he try something else? The battle rages between the appetite of hunger and the fear of social disapproval in the form of punishment and disgrace. If the adjustment were immediate—if the man broke the window, snatched the bread, and ran—there would be no conflict; but when he weighs one motive with another, there is a conflict. Such a conflict is usually resolved by a compromise; that is, both conflicting motives influence the behavior. The outcome of the conflict is usually some indirect means of achieving satisfaction without running counter to other motives. In the example above, the battle is won for the appetite

of hunger, but the fear of punishment leads the hungry man to find some other means of satisfying hunger than the direct means of taking the food.

A motive is most persistent when it is interfered with, obstructed, or thwarted. Dam up a stream of water, and a source of power is created that will break through somewhere. Interfere with a motive, and the tension is increased, the motive increases in power and insistence, and like the water it will break through somewhere. Conflicts must be adjusted; or, to state this otherwise, the individual must adjust in some way to difficulties and obstacles in the path of his active motives. This adjustment may be nothing more than a conscious giving up, but it must be some form of adjustment that is for the time being the best solution of the difficulty that the individual thinks he can make.

Interference with motives may come from a number of sources. There may be antagonistic urges; that is, one fundamental trend may conflict with another or others, and all cannot be gratified. A motive may collide with the established habits, ideals, or conventions of the individual, or with the laws, taboos, of the society in which he lives. The mere fact that we find it necessary to have laws indicates the potency of these human motives, which, it seems, must be kept in check somehow. Another source of interference is natural obstacles or unchangeable realities. Famines, wars, business depressions, death of parents, and so on, may thwart many urges and prevent their normal satisfaction.

What happens when this thwarting occurs? Put a hungry cat in a puzzle box, with food within sight outside the cage, and what does the cat do? He tries all kinds of activity until he is successful in finding a way out of the box. Place a motivated human individual in a situation where it is impossible for him to achieve immediate satisfaction, and what does he do? He follows the example of the cat. He tries a number of activities until he discovers an adjustment

that is successful in removing the motivating tensions. Adjustments are learned. Put the cat in the box a number of times, and he will eventually learn to get out immediately. Make it necessary for an individual to adjust to difficulties a number of times, and he acquires a habit of meeting such situations, even if the habit is merely that of giving up and saying that the effort isn't worth while.

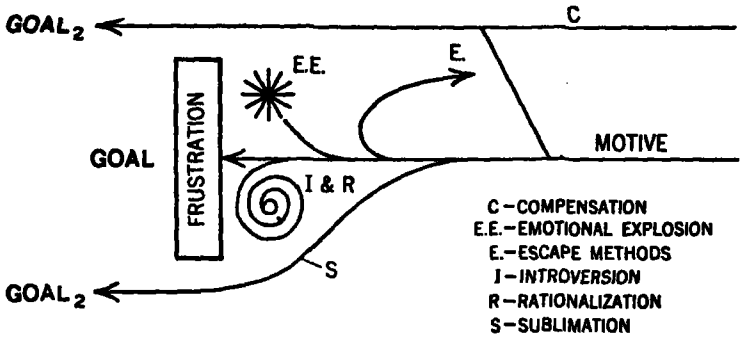
There are great individual differences in the ability to withstand the thwarting of active motives. At one end of the scale there is the stolid individual who maintains his poise through everything; nothing seems to upset him. At the other extreme is the individual who is very easily upset; the slightest setback and he is neurotic, greatly disturbed, has a temper tantrum, or a fit of "nerves," or becomes sulky. What makes the difference? It is pretty much a matter of experience.

The child of two, when he is faced with a situation that thwarts his desires, may fly into a fit of anger and have a temper tantrum. The worried parents fly to his aid, and he can have anything in the house as long as he will stop this terrifying behavior. What will he do next time? Why, repeat the kind of performance that worked this time, of course. The same thing may go on until the parents in disgust stop being worried and let the temper tantrum go unrewarded, or perhaps the schoolteacher will have the task of dealing with it. If this form of behavior has been successful enough times, it may persist even into adulthood and the person may go on having tantrums when things go wrong. Let us suppose that the parents knew about temper tantrums and were not worried, even when the child held his breath or screamed, and let the tantrum die a natural death, what would the child do then? Well, having learned that this method of adjustment wouldn't work, he would try something else, and eventually find some way that would work, at least in the home situation. Perhaps he will have to discover another method for school and still another for the

street. The way an individual adjusts to thwarting depends mostly on his experience.

2. COMMON METHODS OF ADJUSTING TO FRUSTRATION

There are many ways in which individuals adjust to difficulties and obstacles. We will list here the more common ones.



We may adjust ourselves to frustration by *complete surrender* or by admitting defeat; we may attack it directly by an *emotional explosion* of anger; we may use one of the mental "foolers"—*introversion, rationalization, escape methods,* or *compensation.* But if we try to make the most of our frustration, we will find a new outlet by sublimation—often the best adjustment to a blocked motive.

a. Surrender.

He may give up, submit to defeat, admit failure. This form of adjustment cannot be a permanent adjustment to any situation. It does not dispose of the conditions that produced the necessity of adjustment; but it may become a habit—the habit of failure. Nothing is so conducive to failure as continual failure. Failure produces an attitude of "what's the use?" that kills chances for success. Continual failure begets further failure. It produces the expectation of failure because of imagined inability to succeed in anything. This is what is commonly called an *inferiority complex.* The individual shrinks from trying because he expects to fail and hates to have anyone find out that he isn't as good as others.

This attitude may be built up in the growing child through tasks that are beyond the existing stage of his development, and not through any deficiency in intelligence or ability. This form of adjustment, which is, of course, inadequate and unconstructive, may be very detrimental to normal development.

b. Direct attack.

The overt form of adjustment is that of giving battle to the difficulty. When this method of approach is kept within the bounds of common sense, it is the most wholesome form of adjustment. The danger is that the direct attack may be irrational, not thought out, ruthless, and too severe. Direct attack may be in terms either of an anger adjustment or of an intelligent, rational attack on the difficulty. Anger as an adjustment to difficulty, while common enough, is rarely adequate or efficient, as it always represents a certain loss of control. Direct attack on problems may also be made with intelligence and insight and, in this case, it is the most healthy as well as the most useful form of adjustment.

c. Introversion.

Perhaps the most common form of adjustment to difficulties is introversion—turning inward—a purely mental adjustment. This is really a partial surrender, the giving up of the outward struggle, while carrying the battle to a new arena within the thought and imagination. When real satisfaction is difficult, imaginary success may be substituted.

One form of introversion may be called the *conquering-hero* mechanism. Much of the daydreaming of both children and adults is of this nature. The child is denied toys, candy, or playmates, but finds these desires satisfied in his "castles in Spain." Adults in daydreams succeed in achieving the desired wealth, social position, or power that they have been unable to win for themselves in real life. The satisfaction is just as real to the individual, but not so permanent. What



Courtesy United Artists—scene from "The Private Life of Henry VIII"
Boys may dream of being a king—girls of being a court lady dressed in silk and satin. Such mental recreation is not harmful unless it is carried to the extreme.

small boy hasn't, in imagination, won the football game for his school in the last minute of play, outhit Babe Ruth, beaten Williams or Nurmi, and been very happy in doing it, too?

In our imaginations we are all extraordinary persons—great singers, orators, businessmen, statesmen, athletes—winning the applause of multitudes.

This form of adjustment is a perfectly normal and satisfying kind of recreation and does little harm, except when it becomes the habitual method of adjustment and is substituted for real action. The danger lies in the extreme. Every mental hospital has its "Napoleon" scrubbing floors or hoeing in the garden, suffering from an extreme form of this normal activity, labeled "delusions of grandeur." Dreams are all right as long as we realize that they are only dreams; but when they tend to become so satisfying that we begin

to believe in them, it is time to discard them for some better method of adjustment to life's failures.

Another form of introversion, called the *suffering-hero* mechanism, may be illustrated by the following story. The small boy has been punished, perhaps unjustly (most punishments are unjust). He would like to run away, but he hasn't the courage to leave the security of his home for the unknown dangers of the cold world. There is nothing to stop him imagining that he has run away, has had an accident, and is badly hurt or perhaps killed. In vivid pictures he paints for himself the remorse of the parents or the teacher. He sees them weeping when they hear of his death. Is there a person anywhere who hasn't said, at some time or other, "You'll be sorry, some day"? This is all trivial and meaningless, you say? Nevertheless, the boy in our story has achieved an adjustment to this thwarting situation—an adjustment that is not particularly healthy. If such an adjustment becomes habitual, he feels that the world is against him, that everyone is trying to "get" him, that he is being "picked on." Then he is well on the way to what the psychologist calls "delusions of persecution." Real actions are usually better than imaginary ones. Even in the case of the boy, it might have been better if he had run away. Perhaps, then, there would have been a real solution; perhaps, his parents would have discovered that they were not fair. At any rate, the smoldering sense of unfairness and injustice would have been removed.

Introversion may take the form of *identification*. We go to a motion picture, and within the space of a few hours we have loved, dared, killed, won the heroine, and lived happily ever after. Much of the enjoyment we draw from the stage and the moving pictures, the novel and the drama, the concert hall and the radio is a kind of vicarious satisfaction in the great exploits of the characters portrayed, with whom we identify ourselves. There is much satisfaction and little harm in such activities. However, it does seem as though we

had gone a little too far nowadays in buying artificial thrills. The danger is that we will leave the real accomplishments to our fictitious characters and neglect to accomplish anything for ourselves. Fancy has its place, but that place is not as a substitute for action.

d. Rationalization.

"Rationalization" is a big name that is given to the process of fooling ourselves and others as to the real reasons for our actions or failures. For example, a man buys a large and expensive radio set. There may be many reasons why he should not do so—the grocery bill he owes, the insurance he needs, the dress his wife should have, etc. However, he does buy the radio. The real reason why he wanted the large set was that all his friends had good radio sets and he desired the social approval of having what everybody else had. This reason is hardly the kind of motive that he would like to admit to himself, let alone to anyone else, and so he finds other reasons—the family will save money because they can listen to the radio instead of spending money going somewhere else for their entertainment, there is a great educational value in radio, and so on. The main thing is that he must find a reason that is acceptable to himself and that he actually will accept.

Failures are usually attributed to something other than our own deficiency of ability or effort. If we slice in golf, it is the wind or the golf club or something else. If we fail in an examination, the questions were unfair or the teacher was poor. If we drink, we inherited the taste, the temptation was irresistible, or our wives drove us to it. By such rationalizations we escape the annoying necessity of admitting our own failures, and we achieve some degree of satisfaction in an unsatisfying situation, in being able to fix the blame on our ancestors or on circumstances. If we can get the blame fixed where there can be no "come back," it is all the more satisfying; so the most common rationalization for failure is that

we inherited a weakness or lack of ability from our parents. If there is no one else on whom to project our troubles and failures, we blame them on the Lord—we were made that way.

Or we may rationalize by making light of the desirability of the goal sought but not realized. If we lose our job, the job was no good anyway. If we are poor, money is the root of all evil. If we are not beautiful, the pretty girl is always dumb. We might rationalize our deficiencies by emphasizing the desirabilities of what we have. In such ways we rationalize our lack of success and succeed in excusing our deficiencies to ourselves. A rationalization is always convincing to ourselves, whether or not it is to others. We accept it because it places us in the best possible light.

Our thinking is full of beliefs, superstitions, and prejudices that we have been able to keep impervious to evidence and have rationalized so long that they are fixed. The man scrubbing the floors in the mental hospital and thinking he is a king and the man who insists on the superiority of his race, city, or make of automobile are both making use of the same mechanism. They are both blind to some parts of the evidence; and they are both guilty of watertight thinking compartments.

e. Defense mechanisms.

Another form of adjustment to difficult situations, which is not so common as those already mentioned, is usually called *defense mechanisms*. Some examples of defense mechanisms are the examination nausea that keeps the ill-prepared student from failure, the real but induced headache that keeps someone from a difficult social situation, and some forms of the so-called shell shock of wartime.

A defense mechanism is an organic condition of some kind produced by a situation that is too difficult or unpleasant—a condition that is adequate to remove the unpleasant situation. This does not mean that persons who use such means are malingerers, because they are not. Often the condition

that results comes after a very serious conflict or struggle between opposing motives, and the adjustment that is made nonvoluntarily is the production of symptoms that keep the individual from participating further in the disagreeable situation.

f. Escape by means of drugs and alcohol.

One method of adjusting to difficulties, used frequently, is to try to "drown" one's sorrows in alcohol or other drugs. This cannot be anything but a temporary adjustment, as the problems, difficulties, and frustrations are still there when the effect of the drug has worn off.

g. Escape by running away.

This method of adjustment, sometimes called *nomadism*, is rarely, if ever, successful. The individual who moves from one job to another or from one town to another or from one course to another, usually finds that his problems go with him and that he cannot escape his frustrations by running away from them, as he usually takes them along with him.

h. Regression.

Regression is an attempt by the individual to find satisfaction in a form of activity that, earlier in development, was quite acceptable and satisfying, but that he had outgrown. One example is that of the child who as a baby derived considerable satisfaction from sucking his thumb, but who has outgrown that activity. When he starts in school and finds the situation difficult and lacking in satisfaction, he may revert to the thumb-sucking activity. Another case is that of the middle-aged man who, finding his life rather dull, may regress to some form of behavior that was quite satisfactory to him as an adolescent but that he had outgrown. This is a rather unhealthy form of running away from frustration and from problems.

i. Sublimation.

The method of adjusting to thwarting known as *sublimation* is used when the individual finds a new outlet for a blocked motive. One very common form of frustration in our civilization occurs because the appetite of sex matures and becomes active years before the individual is able to achieve a normal satisfaction in marriage. The young man or woman can in this situation look for and find satisfactory indirect ways of achieving some satisfaction of this powerful motive. Dancing, games, athletics, and other forms of social activity in which the individual may enjoy the company of persons of the opposite sex are methods of achieving sublimation of the sex motive; but sublimation is not confined to the appetite of sex. Indeed, it may occur in the case of any blocked motive.

j. Compensation.

Another form of adjustment to thwarting has been called *compensation.* The unprepared student at an examination fills his paper with volume to compensate for a lack of facts. The man forced to be submissive and obedient at work may be overbearing and dictatorial at home. There are some forms of compensation that are undesirable, such as addiction to alcohol or drugs as a compensation for failure in business. Many, if not most, compensations are not only desirable but highly beneficial to society. Many of the great achievements in art, literature, and science have come as the result of a wise compensation after the thwarting of some strong motive. When there is an obstacle that prevents the active motive's receiving its natural expression, the substitution of some worth-while activity seems to be the best kind of adjustment that can be made.

It has been said that, if there were no taboos, restrictions, laws, or prohibitions that inhibited the free expression of our basic motives, there would be no mental illness or disorder. Whether this is true or not, it certainly is true that if such a

condition of affairs prevailed there would also be no real progress. It is only through difficulties and problems that any really worth-while contributions are called for. As we shall see in a later chapter, one essential condition of learning is the presence of a problem. When the direct means of satisfaction is barred, we invent new ways of doing things. When the path of courtship is long and rough, great love lyrics are born. The easy road never spurs men on to great efforts; but difficulty, obstacles, and problems often call for supreme efforts.

OUTLINE OF THE CHAPTER

Mechanisms of Adjustment to Frustration

I. Sources of frustration.
 1. Conflict of antagonistic motives.
 2. Customs, laws, moral standards.
 3. Obstacles in the environment.
 4. Limitations in self.

II. Mechanisms of adjustment.
 1. Direct methods.
 a. Surrender.
 b. Direct attack.
 c. Emotional explosions.
 2. Indirect methods.
 a. Introversion.
 i. conquering hero.
 ii. suffering hero.
 iii. identification.
 b. Rationalization.
 i. projection of blame.
 ii. making excuses.
 3. Escape methods
 a. Defense mechanisms—illness.
 b. Alcohol and drugs.
 c. Nomadism.
 d. Regression.
 4. New outlets
 a. Sublimation.
 b. Compensation.

Review Questions

1. Describe sources of frustration.
2. Make a complete list of methods of adjusting to frustration and briefly describe each method.
3. Which methods are more acceptable socially?
4. Which methods do you think are most desirable and which least desirable? Indicate why.
5. Select an example of frustration from your own experience and show how you adjusted to it.
6. It has been said that if there were no frustration there would be no social progress. Comment on this.
7. Compensation may be either desirable or undesirable. Explain.
8. Identification can be a useful safety valve in an essentially frustrating world. Show how.
9. Show how frustrations may come from within as well as from outside the individual.
10. All frustrations should be removed from the life of the growing child. Do you agree or disagree? Why?

Chapter VI

INFLUENCING OTHER PEOPLE

I. INTRODUCTORY STATEMENT

LIFE presents many situations where it is necessary to direct the course of action of other individuals. We want them to buy our commodities, to vote for us, to participate in some project with us, and so on. Education, religion, advertising, propaganda are organized attempts to influence the course of behavior of people. Adequately to treat this topic of how to direct the actions of others would require a rather large-sized volume, so we must content ourselves here with a mere outline of the more usual forms of social control and hope that those readers who are interested will build on this scant beginning by further reading.

Society has built up many rather elaborate techniques for the purpose of influencing the actions of its members. Education is a method of training the developing individual into rather well-defined lines of activity. Laws are laid down to regulate the activity of the members of an organized society. Advertising has been invented as a means of directing the buying of nations, and incidentally has become a very expensive means of social control. Fashion in dress, speech, habits, and so on, is a powerful directing influence on human behavior. Rewards and punishments of various kinds are the usual techniques for coercing people into definite lines of action. Praise, flattery, persuasion, threats, commands, gossip, rumor, propaganda are a few of the uses of language that are designed as ways of influencing the behavior of other people. Most of these techniques work through the basic motives that we have already discussed.

There is one feature of social control that deserves a little more attention at this point. This is the so-called force of suggestion in directing the behavior of others. A person's activity may be said to be directed by suggestion when he accepts uncritically the ideas, requests, or example of another person. When an individual adopts the ideas of others without any real evaluation of those ideas, or when he does what others do without thinking out this course of action for himself, he may be said to be acting on the suggestion received from others. We are convinced by two kinds of influences—by the statement of logical facts or carefully organized proofs and by suggestion. By all odds the more common in human life is suggestion. Thinking things out for oneself is not the easiest way, so most of us adopt the short cut to conclusions and ideas and ways of doing things, which is the acceptance of the ideas and conclusions and methods of others.

The use of suggestion to control the behavior of other people is very common. Suggestion may be thought of as something to be guarded against or as a technique to be employed; it all depends on whether we happen to be interested in safeguarding our own action or whether we are interested in controlling the behavior of other people. However, no matter which interest we may have, we can learn much from a brief study of the prominent features of the process. The three important characteristics of suggestion are (*a*) that an idea enters the mind from without, (*b*) that this idea tends to produce action, (*c*) that the idea is accepted uncritically.

Every stimulus tends to produce action, or, in other words, there is a tendency to respond to every stimulus received. We do not react to all such stimuli, because there are other things that hinder this response; but, if there are no such inhibiting features, a response follows the stimulus. These inhibiting features may be in the form of counterideas, or habits, and the idea received is evaluated in the light of these other ideas and established habits. This evaluation

does not always occur, and when it is absent we respond to suggestion.

There are a number of conditions that are conducive to an effective condition of suggestibility, or, in other words, that predispose the individual to act on the suggestion rather than to evaluate it. Indirect suggestions are more effective than those that are direct; that is, if the idea is not obviously the product of another but appears to arise within the mind of the individual himself. A suggestion that seems to strengthen ideas already present is usually productive of action. A concentration of the attention on the suggestion and the exclusion of other stimuli and thoughts usually results in the suggested action. This is one of the main techniques of hypnosis, which is an extreme form of suggestion. Anything that indicates a condition of submission is a condition productive of the acceptance of suggestions. A child is usually submissive to an adult, and a child is usually very suggestible. Differences in experience, reputation, strength, social position may be effective in producing this attitude of submissiveness and therefore suggestibility. We are all suggestible to large numbers. If "everybody" is doing it, this is often sufficient cause for our falling into line; that is, unless we have built up habits of being negatively suggestible to others.

2. SIMPLE TECHNIQUES USED IN INFLUENCING OTHERS

Everybody at some time or other, and most people quite frequently, want or need to influence some other person or persons. We often fail in this because we are ignorant of human nature or because we do not use some rather simple but very effective techniques such as those that will be described in the following paragraphs.

a. Capture his attention.

In order to influence anyone, it is necessary to capture his attention; for the person who can effectively capture and

hold the attention of others is the person who can influence their behavior. One simple method of capturing the attention of others is the use of dramatic movement. Things that move catch our attention, whether they are moving lights or a moving story; but movement or change alone, while it is effective in capturing attention, will not hold that attention unless it happens to be dramatic, that is, unpredictable. Everyone possesses at least some curiosity; and anything that seems to be going somewhere though he does not know where, will hold his attention, at least long enough for him to find out where. That is why it is so difficult to put down a good detective story or a good love story until you have finished it. Your curiosity has been aroused and you pay attention until you find out who the murderer was, or whether she finally marries him after all. If you know just what the preacher or a lecturer is going to say, you might as well go to sleep; but, if the speaker has succeeded in making you curious, if he has set up a dramatic situation, or if he has aroused a question in your mind, you simply must pay attention until your curiosity has been satisfied or your question has been answered.

b. Sympathetic induction of attitudes.

We produce in others the attitudes and feelings we show ourselves. For instance, if we are trying to interest someone in something, it is necessary to show an intense interest ourselves, for interest tends to be infectious. A frank, cheerful manner tends to produce the same in return. An irritable teacher often is mirrored by her class. So, in order to produce in others a desirable set of attitudes, the first essential is for the individual to show these attitudes himself.

c. Get him started right.

It is much easier for an individual to continue in a direction than it is for him to change that direction of activity. This means that, in order to influence an individual in any

line of activity, it is necessary to get him started right. It is much harder to change a "no" into a "yes" than it is to keep a person saying "yes" once he has begun. A door-to-door book salesman illustrates this technique in the following incident. He calls at a home and the door is opened by a busy housewife. "Are you Mrs. Brown?" (He has ascertained her name from a neighbor.) As this is her name there isn't much for her to say except "Yes." "And you have three children?" (Also picked up from the neighbor.) "Yes," again is her answer. "And these children go to school?" Of course, again her answer is "Yes." "And they have homework to do?" Again her answer is "Yes." This continues until she has yessed herself into buying an expensive set of books.

d. The use of newness or novelty.

A certain amount of newness or novelty is necessary to catch the attention of people and influence them. However, this novelty should not be too different or unfamiliar, for people are a little afraid of things that are too strange and different. On the other hand, they do not listen at all to the old familiar story. Why should they? So, what is required is a judicious mixture of the old and the new.

e. Recognize limitations.

There is a limit to what can be done at one time. There are limits to the attention we can command, and there is a limit to the amount of influencing that can be accomplished on one occasion. We sometimes lose out because we try to do too much at a time.

f. Appeal to basic wants and needs.

In order to influence anyone, it is necessary somehow to appeal to basic wants and needs. The mere giving of information rarely makes any difference to the person. For instance, here's a boy who has been bombarded with facts about health and hygiene by his parents, teachers, and public-



Courtesy Greek War Relief Association and Best & Company
We react immediately to pictures because we are visual-minded. Could facts or written appeals carry this message as well?

health nurses for years; but it has meant very little to him and has failed to influence him at all. When this same boy wants to make a place on his school hockey team, however, he is eager for information about ways of keeping in condition, and, with this strong desire as an incentive he can be easily influenced in health habits. People are rarely influenced by appeals to reason or the statement of facts or the recital of statistics; for an appeal to reason, if it is not at the same time an appeal to some want or need, will be ineffective. This is true whether it is a matter of votes, sales, beliefs, or what not. "This is for your own good," or "this is your duty," are almost meaningless unless it is at the same time obvious that the individual will receive some satisfaction of a want or a desire that is present. Preaching, scolding, expostulating are usually a waste of time. So, if you wish to

influence anyone, look for some fundamental motive and hook your appeal to that.

g. Paint word pictures.

An appeal, to be effective, must be vivid. Most people are visually minded; that is, they can see and understand pictures better than they can explanation. Pictures often make a difference to the person when cold facts leave him cold, too. Tell a group how many crippled children there are and that so much money is needed for their care, and appeal to them by telling them that it is their duty to support such a worthy cause, and you will be able to get a few contributions of loose change. But make a group see vividly a child in need, paint a picture that they can see, and many of them will be moved to give even more than they can afford.

h. Breaking down defenses.

It is necessary to get past the ordinary defenses of people. Today, most of us have been bombarded by so much high-pressure advertising and salesmanship that it is necessary to have some defense against it. Ordinary appeals no longer affect us. We are better educated and better informed, as a people, than we used to be. So, to get anywhere with attempts to influence others we must arouse their latent interest and break through their first line of defense. How is this done? Try a little experiment. Take the advertisements, books, motion pictures, plays, and articles that have interested you lately. Examine these carefully, and try to determine what it was that caught and held your attention and made a difference to you. You will probably find that it was not abstract ideas but actual life situations. There may have been something different enough to arouse your curiosity, or something unpredictable, a question implying an answer. You may also find that the author or the producer has made use of the shock technique. He has managed to shock you in some

way, so that you can never again think or feel the same about some particular feature of life.

The story is told of a very effective use of this technique by a member of a certain legislature, some years ago. He had presented all the arguments, statistics, and appeals that he knew to the legislature, in order to get an appropriation of $100,000 for public-health purposes, but he seemed doomed to failure; but before the vote was taken, adjournment occurred, and he went to his office to try to figure out what he could do. He knew that he had presented all the arguments he had, and still he had not been able to influence the members of the legislature. He thought about it for some time before finally hitting on something that he thought was worth trying. He put his stenographer to work and gained the cooperation of the janitor. The next day, when the members arrived at their offices, they found in the center of each desk a sheet of paper. They were curious as to how it got there, and most of them picked it up and read: "A sick mother with a baby is told by her physician that she has tuberculosis and that she should seek a higher altitude. Lack of means prevents her from going. She appeals to the government and is told that not a dollar is available to save the mother and her child from death. At the same time, a farmer notices that one of his hogs has cholera symptoms. He sends a telegram collect to the government, and an inspector comes the next day, treats the hog, and saves it. Moral—be a hog." The bill passed without a voice raised against it.

If you wish to influence anyone, whether it be a customer, a son or a daughter, a wife or a husband, a neighbor, or a group of voters, here are some questions that you might ask yourself about your methods. Does my presentation move? Is there any dramatic suspense? Will it arouse curiosity? What about my attitudes, manner, and feelings—are they the kind I want to see in the other person? Can I get him started in the right direction? Is there anything new or different in it? Am I trying to do too much at one time? What

need or want am I going to tap? Is my appeal vivid? How am I going to get past the defenses of the individual?

3. EFFECTIVE SPEAKING

One very common method of attempting to influence people is by means of public speaking. There are a number of simple techniques that apply to public speaking that, if kept in mind, should aid greatly in making the speaking more effective.

a. Be prepared.

Know what you want to say. It is so difficult to listen to the rambler that few will do so. Marshal your facts and arrange them in such a way that they move and that your audience moves with you to see where you are going.

b. Think of your audience.

Picture your audience—what they are like, what they are interested in, and what they wish to hear.

c. Look at your audience.

Since it is to your audience that you are speaking, you owe it to them to direct your eyes in their direction. This means looking at all parts of the audience, so as to include everybody.

d. Keeping attention.

Try to keep your audience active—thinking along with you. This means that you need not do all the thinking. You assume that they are intelligent and that they can follow what you are saying and that they can fill in some things for themselves.

e. Talk the language of your audience.

Never make your audience feel inferior. If you want the members of the group to be influenced in an effective way,

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it is necessary not to try to show off by using words and ideas that are unfamiliar to the listener. Instead of trying to indicate that you know everything and the listener knows nothing, make the audience feel that you are aware of their intelligence and knowledge, and appreciate them.

f. The use of humor.

When you try to use humor, make sure that it is humor. Good humor does not include any kind of belittling, especially belittling of members of the audience. Humor does help, if it is real humor, but nothing falls quite so flat as an attempt at humor that is not humorous.

g. Avoid extremes.

Avoid the ordinary and the extraordinary, as well. The ordinary fails to arouse interest and attract attention, and the extraordinary often arouses incredulity and causes the audience to react against what you are saying. There must be enough of the new and different to attract attention, but not so much as to detract from your theme.

h. Know when to stop.

Stop when you have finished and before the audience has gone to sleep. There is a limit to what any audience can take in, and it is usually better to send them away wishing that you had gone on longer than it is to have them wish that you would come to the end.

What makes speaking dull and uninteresting? Stodginess —that is, lack of unfamiliar or new material mixed in with the familiar; verbosity—too many words; circumlocution—going round and round, without getting any where; lack of clearness; lack of dramatic quality; monotony—lack of high lights; generalities—lack of vivid pictures—these are some of the factors that make speaking dull and ordinary.

OUTLINE OF THE CHAPTER

Influencing Other People

1. Suggestion
 —characteristics.
 —conditions.
2. Techniques
 —dramatic movement.
 —sympathetic induction of attitudes.
 —the "yes" technique.
 —novelty.
 —limits.
 —appeals to basic wants and needs.
 —making appeals vivid.
 —breaking through the defenses.
3. Effective speaking
 —be prepared.
 —think of your audience.
 —look at your audience.
 —keep the audience thinking along with you.
 —never make the audience feel inferior.
 —use humor humorously.
 —avoid the ordinary and the extraordinary.
 —stop when you have finished.

Review Questions

1. Make an outline of the important features in influencing others.
2. Comment on the statement: "He who attracts and sustains the attention of others is usually successful in influencing them."
3. Outline a plan to improve an individual's ability to speak in public.
4. Describe three kinds of situations in which it is necessary to influence other people.
5. What do you understand by the term *suggestion?*
6. What are some of the conditions of suggestibility?
7. Show how you could use the information in this chapter in such a practical situation as selling life insurance.
8. What are some of the more usual defenses against "being influenced"?
9. Indicate how you could apply this material in your own work.
10. Why do you think it is necessary to think of your audience in order to be effective in public speaking?

Chapter VII

THE REGULATION OF CHILD BEHAVIOR

1. INTRODUCTORY STATEMENT

An important area of human activity, in which the knowledge of motivation can be applied with good effect is that of the training and education of children. There was a time not so very long ago when the good disciplinarian was thought to be the person who could and did make children under his care tremble with fear, jump to obey his commands, and in general behave as well-behaved children should; but this point of view is changing rapidly. No longer do we think of discipline as stern repression and the giving of commands that must be obeyed. No longer can the teacher or the parent depend on the big stick and his assumed authority to keep children in order. In fact, we are sure now that such methods are not only undesirable but actually harmful to the well-being and normal development of children. The discipline of fear and strict punishment is out of fashion, and rightly so. It has taken a long time to advance from this old method, and the need for reform has not been completely met as yet. In this chapter we will develop briefly what we call a reasonable scheme of discipline, based on knowledge and experience of what various techniques and influences do to the developing child.

2. TWO EXTREMES IN DISCIPLINE

The main difficulty in the reforms of discipline today is that many can think only in terms of opposites or extremes. If the old, traditional discipline of fear and trembling is not the best way, then they think we must go to the other

extreme—have no control or regulation of children at all, let them do as they wish, allow them free expression. However, this does not necessarily follow. The discipline of fear is based on the idea that the child was by nature "bad" and must be treated in such a way that the badness would not be allowed to come out. He must be hemmed in by all kinds of regulations and penalties; he must be treated harshly, bossed, punished occasionally; or else he would become spoiled—the badness would come out. The other extreme position is that the child is by nature "good"; therefore, he should be allowed to do as he pleases, he should be allowed to express himself, he must not be regulated, his goodness should be given a chance to come out.

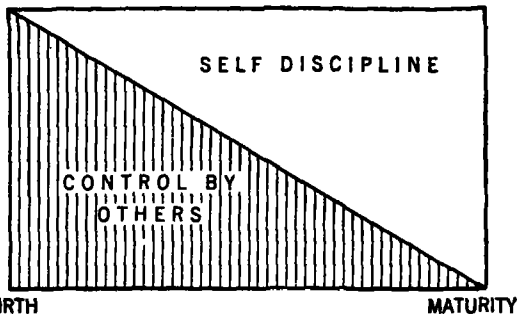
What has been the result of these two extreme positions and their related techniques? The discipline of fear produced in the main, "good" children, who did what they were told to do, who gave little trouble, who were well behaved. But these same children, obedient and submissive, turned out to be in a great many cases adults who couldn't run their own lives very satisfactorily, who carried with them the effects of fear and lack of initiative, who contributed very little to the business of living. The discipline of free expression produced children (and adults too) who had failed to learn some of the essential lessons of living, who thus tended to run rough-shod over all necessary social restrictions—who were, in short, a nuisance.

3. A REASONABLE SCHEME OF DISCIPLINE

There is no reason why we must go to either of these extremes in discipline. There is a middle course, which we will describe as a reasonable scheme of discipline, a method that preserves the best in both extremes.

The child when he is newly born knows nothing, must learn everything. He is completely incapable of directing his own affairs and making his own decisions. Someone else must

direct his activities. Because of his immaturity and ignorance, the regulation of his behavior must rest with someone else. But when this same person has become an adult, he must take charge of his own life; he must regulate his behavior for himself, make his own decisions, and run his own affairs. Between the infant whose affairs must be controlled by someone else and the adult, who should control his own activity, is the child, developing, learning, growing. This child must be protected from making too many costly errors, must be helped to learn what will help him to live happily and efficiently; but we must never lose sight of the fact that this child will some day be an adult and thus, we hope, be self-regulated. This, then, is the goal and guiding principle of all discipline for the child—that he is being prepared for self-control, self-discipline. This is a long-term view that must be taken. It isn't good enough to think only of today and the production of a well-behaved child, obedient to all commands; we must remember his tomorrows, when we expect him to do more than to obey—to show initiative, self-control, and self-regulation. Thinking of the tomorrows means that we should provide plenty of opportunities for him now to practice self-regulation, to make choices and decisions.



The individual makes a gradual shift from external control by others when he is a child to self-regulation as he becomes an adult.

To these ends, it is not enough for discipline just to keep children good and quiet, but it should provide opportunities for learning and the practice of living with others. Discipline is arranging conditions for effective learning—not just reading, writing, and arithmetic, but all phases of the busi-

ness of living. Discipline is not just the big stick brought out when things go wrong, but the ever-present atmosphere of the home or of the classroom that is conducive to learning.

When we think in terms of persuading a child to do something, the easiest and simplest method is to use some kind of reward or bribe—a prize, an honor roll, a word of approval, or some other artificial incentive. But the use of rewards is dangerous, because almost inevitably they produce a reward habit—the child expects a reward for anything and everything that he does. He begins to develop an attitude of "what's there in it for me"? He learns to put a price on goodness, and he fails to learn that some things just must be done because they are a necessary part of the business of living.



Bettman Archive

One old-time method of punishing people by scaring them was the hunger cure used in insane asylums. Suspended in baskets over the dining table and forbidden to eat, insane people were supposed to bring themselves back to reason.

When we think in terms of keeping children from doing something that they shouldn't do, the simplest and easiest method is some form of punishment—the strap, the hairbrush, stern disapproval, or some other form of artificial negative incentive that produces fear and thus inhibits

action. Even though punishments work as they do, they are not the best method in terms of our long-term objective of producing self-regulating adults. Punishments have had an interesting history. They began as revenge. The individual had violated some law or custom of the tribe or the family, and he must be paid back for it, the tribe or the family must have its revenge. Then, punishments have been used as a method of deterring from crime, as a method of scaring the individual from wrongdoing. Finally, punishments became a method of reform. But none of these excuses for the use of punishment are adequate. Punishment is a poor method of guiding children, mainly because it is personal—there is a punisher, as well as a person punished. The person punished always resents the punishment and cannot feel happy toward the punisher. In child guidance and training, the most important factor is the relationship between the adult (parent or teacher) and the child. Punishment tends to destroy the confidence, trust, sympathy, understanding, and affection that should exist between the adult and the child.

Of course, the child should not be allowed to do as he likes; and, of course, there must be some form of regulation by the adult. This regulation, however, should be as impersonal as possible; that is, the child is required to live up to the necessary rules of everyday ilving. He cannot escape the requirements of the situations of home and school and community. These requirements should be clearly indicated and understood by the child as necessities of living, not just whims of parents and teachers. If he fails to live up to these requirements, then he must suffer the logical consequences of his own behavior. The adult must see to it that these consequences are enforced, not as punishments with a personal flavor, but as impersonal consequences that the child has brought on himself by his own behavior.

Furthermore, affection should never be used as a method of motivating the child. He should never be led to think that his parents will not love him as much if he acts in a certain

way; nor should they say or imply that they will love him more if he does what they wish him to. This is a personal kind of regulation, which hinders the child from learning some of the important lessons of living. For instance, the child learns to wash his hands before meals, not just to please a fussy mother but because washing hands is what is done. He learns to be honest, not just because father wants him to be honest, but because honesty is a necessity in effective living.

4. LIVING BY THE RULES AND HELPING TO MAKE THE RULES

There is a valuable lesson that every child should learn as early as possible. It is that life consists of two kinds of activity—those things that just must be done, whether he wants to do them or not, and the other things that he may do or not, as he likes. In other words, the child should not be allowed to do as he likes, but he must do many things that he does not want to do and may not enjoy doing very much, but that are necessary. They are necessary, not because some teacher or parent thinks they are necessary, but because the situation demands them. In other words, the "musts" are not whims of adults, but necessities inherent in the situation itself. These "musts" and "must nots" are balanced with the activities that are free activities—things that may be done or not, as the child likes. In other words, he has free expression as well as outside regulation. The outside regulation is impersonal—not a matter of adult whim, but a regulation demanded by the life situation itself. And there must be a balance between the regulation and the freedom—enough freedom so that the child will not feel hemmed in by regulations, and enough regulations so that he will learn that living in a world with other people demands certain things of him.

Further, the child himself should have a hand in the making of the rules and regulations that he is going to live up to. This is the basis of democratic living—that each indi-



Courtesy Los Angeles City Schools
Young people should be given opportunities to participate in activities by actual group practice, such as student government, student-operated radio stations, newspapers, and assemblies.

vidual shall have a chance to make the rules of the game of living. The child needs plenty of practice at this and should be given every opportunity to help make the laws of the classroom, the playground, and the home. There's a different feeling tone to obeying laws that you have had a hand in making, and in obeying the dictates of the lawmaker who sits at the front of the classroom or the head of the dinner table. If we want obedient little machines who always jump when we open our mouths, then the authoritative method is what we should use; but if we want persons who can think for themselves and run their own lives, then we must give them practice in doing just that.

5. UNDERSTANDING, IMITATION, FREEDOM WITH RESPONSIBILITY

Of course, a reasonable scheme of discipline must be truly reasonable—obviously reasonable to the child. Children

usually react well to what is reasonable—that is, to situations and regulations that make demands on them, but yet are not just the cranky ideas of the old grouch who has assumed an authority he doesn't deserve just because he happens to have been hired as a teacher or who is by a biological chance his parent. "Reasonable" means that there is a reason for the regulation or demand and a reason that can be understood by the child. Very often we fail to give the child credit for as much ability to understand as he has. Instead of "Do this because I say so," let him hear, "Do this because it is the kind of behavior that the situation demands."

Children are persistent imitators, especially of those whom they love and admire. On this account, one of the most effective methods of education is that of setting a pattern to be followed. Listen to a group of small children at play and you are almost sure to hear the bossy voice imitating some teacher or parent directing other children. Listen again, and you will hear the usual adult techniques with children—the command-obey method, the big-stick method, the voice of authority, the coaxing method, the bribe, the threat of punishment—a rather sordid picture of human relations. Children learn the patterns of social living that they see; it's all that they can learn. They learn to be intolerant, to be snobbish, to be inconsiderate of others, to be selfish, if those are the patterns that they have to follow; or they learn good manners and good moral standards, tolerance, unselfishness, consideration, if these are the patterns prevalent in their world. Children learn far more than what they are consciously taught. In fact, it would seem that the most important things they learn they acquire through imitation of others, especially parents, teachers, and other adults who are near and dear to them. The child mirrors fairly accurately the social environment in which he lives.

Rules and regulations are indispensable in human relations. A well-run society must have them; but the real danger in the classroom and the home is the multiplication

of rules. No wonder the child occasionally rebels and tries to get away with breaking them. He feels so hemmed in by the rules that, in order to maintain his self-respect as an individual, he must break the rules. So, in a reasonable scheme of discipline, there are as few rules as possible, and every rule is important and essential. These minimum essentials are fully understood by the child; he is helped to understand their necessity and value; he has helped to draft them, and he helps to enforce them. He knows that they are not just the adult's idea but a necessary part of the business of a group getting along together. The child chooses whether he will live up to those rules or not—if not, then he must accept the consequences of his choice. The consequence is, again, not the whim of the adult but the logical natural outcome of his noncompliance. It usually takes the form of his being deprived of the advantages of the group situation, so that the child learns that belonging to a group—a family, a gang, a class, etc.—carries with it the responsibilities of accepting the requirements of the group rules.

SUMMARY OF THE CHAPTER

The Regulation of Child Behavior

Discipline, then, is not just punishing children but a method of arranging conditions for learning. It can be reasonable, impersonal, suitable to the stage of development of the child, and productive of individuals who are self-disciplined. It need go to the extreme neither of strict, stern, uncompromising restriction and severe punishment, nor of allowing unbridled and unrestrained freedom. It can take a middle course in which rules and regulations are balanced with freedom, so that over all there is an atmosphere of cordial cooperation between adult and child. The goal and guiding principle is the guidance of the developing child toward an adulthood of self-control and productive activity. Obedience for the sake of obedience is no longer a virtue, but an understanding acceptance of the necessary rules of the game of living with other people. Guidance and learning take the place of authority and

the command-obey relationship between adult and child. The child is learning to live by living in a democratic social group in which he is practicing self-government. Adult and child become partners in an enthusiastic game of discovery rather than learning to play the boss and the bossed.

Review Questions

1. Comment on the statement: "If you spare the rod you will spoil the child."
2. Why is it not possible to allow the young child to do as he wishes?
3. What are the arguments against the use of corporal punishment with children?
4. What does it mean to employ impersonal methods of discipline?
5. Pick out any statements in the chapter with which you are not in full accord and indicate why you disagree.
6. What do you think the goal of discipline should be?
7. Would you advocate the use of rewards with children? If so, why? If not, why not?
8. Do you agree that approval should be used and disapproval not used with children? Why?
9. Show the importance of imitation in child training.
10. Why is it important for the child to "help make the rules"?

Chapter VIII

FEELINGS AND EMOTIONS

EVERY activity and experience of the individual has a coloring of feeling. Life would be very drab and uninteresting if it were not for the constantly changing feeling tone that is a feature of all activity. From a purely objective point of view, it makes no difference how the individual feels, as long as he goes through the necessary motions; but to the individual himself it matters a great deal how he feels about what he is doing. He evaluates experiences in terms of his feelings, and these feelings determine to a considerable extent the occurrence and repetition of activity. Before we can have a complete picture of the individual's activity, we need to consider this aspect of all activity—the background of feeling. There are occasions when the individual undergoes a radical upheaval of the feelings, when he is emotionally disturbed, and this feature also claims some of our attention.

I. CHARACTERISTICS OF FEELINGS

The feeling coloring of any activity is not a fixed or regular feature of that activity. A certain activity may be very pleasant at one time, while the same activity might have just the opposite coloring on another occasion. There are many conditioning factors. Why is it that one day all experiences seem clouded and unpleasant, while another day things seem rosy and "all's well with the world"? It depends largely on habits of feeling, for there are habits and modifications of habits here, as in all psychological functions. The likes and dislikes that dictate activity are often fixed habits of feeling about particular objects and events. Most persons build up habits of food preference, which, although they

may have no basis in biological utility or actual taste or nutritional values, determine what these persons will or will not eat. Such preferences, or definite feeling tones connected with particular objects, have been acquired, usually in some rather obscure manner. Father makes some unfavorable remark about carrots, and the highly suggestible Johnny acquires a dislike for this item of diet. Johnny comes to the table with no appetite because he has been eating between meals; Johnny is forced to eat up his dinner; and, just as likely as not, Johnny has thus acquired a dislike for some kind of food.

We form a strong dislike for someone we have met, and there is no apparent reason for our dislike. Why? Perhaps by a subtle process this new acquaintance suggests to us some other individual whom we may have known and disliked. His appearance, his clothes, his voice, his manner, or any one of a dozen other features may have been similar in the two cases. The resemblance probably isn't strong enough to arouse a direct recall of the other individual, yet it is close enough to call forth this feeling of dislike. Thus, the ways of feeling are obscure and subtle, but extremely important in daily existence.

Besides the established habits of feeling, there are other factors determining the character of the feeling that accompanies any activity. Emotional experiences perseverate or last and leave their imprint, exerting an influence on subsequent experiences. An individual aroused to the white heat of anger has all his experiences colored by the residue of that anger for some time. He is in an angry mood, and the mood dictates the feeling tone. The condition of the physical organism also has much to do with the feeling tone of the moment. Any physical disorder has widespread effects on mental function; a stomach-ache can change the whole complexion of the day's experiences. Anyone who is in the position of meeting people in order to produce some desired behavior knows how important it is to "catch the prospect

in good humor" or, failing that, to dispel a persisting coloring of unpleasantness. Feelings play an important part in behavior.

Feelings are constantly changing. It is very difficult to study them, because, when we attend to a feeling tone, it changes entirely or disappears. There are no known sense organs for feelings of pleasantness and unpleasantness. They are diffuse and are not located in any part of the body. There are probably only two kinds of feelings—pleasantness and unpleasantness—although there are many shades of these and many descriptive adjectives to describe the different



Between the two kinds of feelings—pleasantness and unpleasantness—are many shades of feeling. Likewise, our attitudes vary in degrees from one of approach to anything pleasant to one of withdrawal from that which we find unpleasant.

varieties of these basic feelings. These feelings accompany all activity and are not separate experiences; that is, they are never experienced in isolation. The duration of an experience modifies its feeling tone; so that, if a pleasant experience is continued for any length of time, it may change into an unpleasant experience.

Feelings are not unrelated to action, because feelings have a behavior side as well. The feeling of pleasantness is closely bound up with the attitude of approach, and the feeling of unpleasantness is accompanied by the attitude of withdrawal. To put this in another way, we characteristically approach, or try to sustain, a pleasant experience and withdraw from, or try to terminate, an unpleasant experience. These attitudes are always present, although they may be inhibited by other considerations. Feelings are thus guides for conduct. So, beside being the background of activity, feelings may also be the directors of activity.

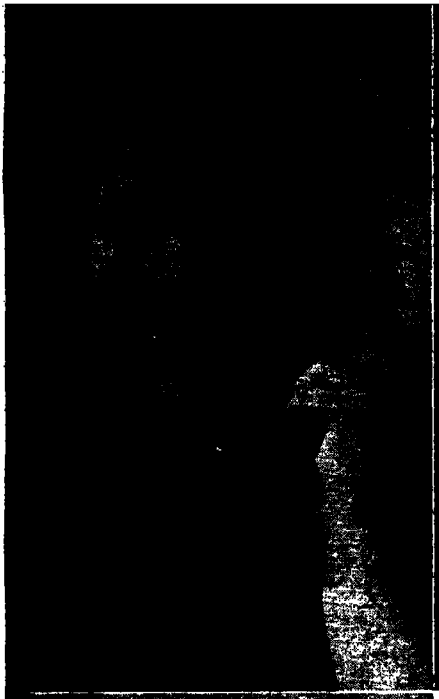
Every situation that calls for an adjustment by the individual is evaluated, and this evaluation is in terms of the feeling tone of pleasure or the reverse. The process does not stop with evaluation but also results in an attitude toward the situation. This attitude may be one of approach or acceptance if the situation is evaluated as pleasant or an attitude of withdrawal or rejection if the situation is evaluated as unpleasant. These attitudes and feelings, as has been already pointed out, are not by any means fixed or rigid. They are subject to change and undergo considerable modification during development.

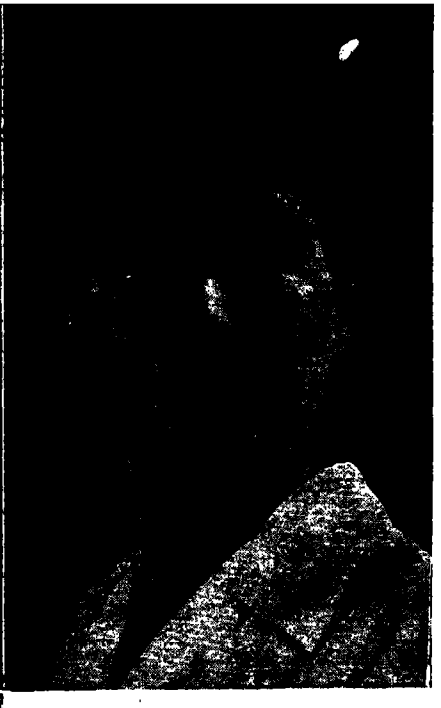
2. CHARACTERISTICS OF EMOTIONS

Emotions are emergency equipment. Anything that upsets the even adjustment of the individual or threatens life or disturbs the peace of mind of the individual is an emergency. Emergencies are too numerous and varied to list here. What do we do in an emergency? We fight, we flee, or we do nothing at all. It depends on circumstances. The very same kind of emergency may cause the individual to be angry and fight at one time, while at another time he will be afraid and take to flight, and again he may do nothing.

Emotional activity does not require a real emergency to put it into action. A man may become angry when his dinner is delayed or when the children are too noisy or when his collar button rolls under the dresser. He can, and often does, lose control of things and stamp his feet and roar and say things that he will be ashamed of later. Anger and fear are two common forms of emotional adjustment that normally occur only in real emergencies but that may become habitual forms of adjustment and occur in all kinds of situations.

Emotions can be trained and educated and made to take second place to ideals. We will fight for our lives in emergency; but we will stand quietly by and allow women and children to be saved first, if our training has been sufficient to make us respect the rights of the weak. Fear is a powerful







Top, Philip Gendreau and Keystone View. Left, Philip Gendreau

Everyone experiences numerous small emotions during the day's events—joy, surprise, and annoyance are a few of them. But anger and fear (*see top of next page*) occur only during emergencies unless we make a habit of using them for adjustments to which we cannot find other solutions.



Philip Gendreau

motive, perhaps one of the most powerful. It has driven men to ridiculous lengths to escape its consequences.

What is the stimulus for anger? Dr. J. B. Watson found that the only way he could produce an anger response in very young infants was to restrict their freedom of movement. If he held the arms close to the sides of the baby, the infant would struggle vigorously. Likewise, if he held the nostrils and thus interfered with breathing, the child showed a characteristic anger response. Obstacles arouse the emotion of anger. Thwarting or interfering with the free expression of the basic appetites and needs of the individual may be an adequate stimulus for rage. Anger as a response to obstacles is also a means of overcoming them, but the difficulty is that the anger response is sometimes so violent and unorganized that the results may be disastrous.

Anger can be trained and modified. We do not learn how

to get angry, but we do learn what to be angry about and when to control the emotion, as well as how to express anger in a socially acceptable way. The child has a temper tantrum, throws himself on the floor and kicks and screams, and gives himself over completely to his rage. What happens? Usually the parents run to his rescue, give him whatever he wants, solve the problem that brought on the expression of rage; they are willing to do almost anything to stop this rather awful spectacle. The child has learned that the expression of anger in an extreme fashion is a useful tool to influence the action of others. As he grows older, he learns that such a means doesn't work with everybody and he has to modify it; but whenever the emotional response is successful, it is strengthened and, whenever it is not successful, it is weakened. Thus, the history of emotional upsets determines their future use as a form of adjustment. Temper tantrums in a mild form may persist as a form of adjustment. We are all familiar with the adult who slams doors and stamps his feet and indulges in other ridiculous activities when he cannot have his own way.

Anger in the adult results from interference with the attainment of goals. Distractions and interruptions when we are busy are likely to call out sudden flashes of anger. Attacks on our self-respect, interference with what we think of as our own private affairs, derogatory comments about our cherished beliefs, reflections on our honor and integrity are all obstacles thrown in the way of our purposes, desires, and goals and are thus usually adequate stimuli for the anger response. The attacks do not need to be directed specifically at our own activities in order to arouse anger. Anything that we are interested in—our friends, our church, our club, our town, our nation—if attacked, may arouse our anger and summon us to their defense.

Anger has more than one form of expression. While it may cause an individual to fly into a rage and smash things, it may also be expressed in more subtle ways. Social custom



Signal Corps Photo

Anger is not without its value. When our nation has been attacked, it arouses our anger and summons us to fight in its defense.

dictates that violent expressions of anger are to be frowned on; but social custom permits the venting of rage in taunts, sarcasm, threats, and verbal abuse if it is sufficiently veiled in conventional language. Indirect and subtle ways of expressing anger are limited only by the ingenuity of the individual. Anger may be aroused and expressed in a great variety of ways.

Anger is not without its value. It is productive of a vigorous and aggressive and determined kind of attack on difficulties and obstacles in the attainment of desired ends and goals, although it often defeats its own purposes by its very violence. Obstacles to social progress, social evils of various kinds often persist until someone stirs up enough people to a pitch of righteous indignation sufficient to produce results.

Why are we afraid and what are we afraid of? Fear is very common, much too common for the good of mankind. Most

people have a rather well-stocked museum of fears. Fear is a natural reaction to a certain number of situations. We do not have to learn to be afraid, but we do learn to be afraid of many things that we did not originally fear. Dr. J. B. Watson found that young children were afraid of only two situations, loud noises and the removal of support. But, you say, children are afraid of the dark, of strange people, of strange places, of dogs, rats, lightning, and thousands of other things. Yes, but they learned to be afraid of these things. Watson took an infant whose only reaction to a rat was curiosity and the desire to stroke it and play with it, and when the child was stroking the fur of the rat, Watson made a loud bang behind the back of the child. The child was afraid, trembled, and cried in terror. This was repeated once more, and what happened? The child was afraid of the rat, screamed with terror when it was brought into the room. The child had learned to fear the rat, because of the association of the rat with the loud sound—not just that rat but any rat, any furry animal, and even his aunt who wore fur around her neck.

Johnny will not leave things alone in the parlor, so his mother invents a bogey man who "gets" little boys when they are naughty. Mary persists in going out of the yard, so her poor distracted mother invents bad men who carry little girls away. When little Charlie won't eat his breakfast, mother tells him that the policeman will come and take him to jail. Soon the minds of these children are crammed full of imaginary dangers and emergencies that must be feared. Mother is afraid of thunderstorms. She runs and hides when the lightning flashes, and her little brood soon learn to fear the storms. Tender little minds listen to gruesome stories before the children are put to bed; then the dark is peopled with all kinds of fearsome monsters. Sometimes in church hell fire is held up as an object of fear to scare men into being good.

Fear is unnecessary. It should be left behind with other childish things. Fear has had a too prominent place in human life. Many unnecessary fears are taught. One nation learns

to fear another, one race fears another with often serious results, which need never have come about if the fear had not been built up in the first place. As long as fear dominates the nations, there will be wars and rumors of wars. Anything may become a feared object. It all depends on experience and training. Fear is inefficient. An intelligent understanding of a situation is much more effective as a starting point to dealing with that situation than a fear of that situation can possibly be.

Like anger, fear may have various expressions. It does not always produce flight. It may lead the individual to avoid danger situations or to take a more cautious and alert attitude on such occasions. Fear may produce a complete paralysis of all action so that the individual will be incapable of doing anything but scream with terror or faint. Fear is aroused by any present or imagined danger. What the individual will do in such situations depends to a great extent on his previous experience and training. Fear is a real motive or director of activity. It has been used by the church, the state, and the home as a means of arousing certain kinds of activity. Fear may become the habitual adjustment to any new situation; then a shy, overcautious, inhibited individual will be the result.

3. THE ORGANIC STATE IN FEAR AND ANGER

When an individual is emotionally upset, there are far-reaching organic effects. An emotion is in part an organic response to an emergency, either real or imagined. In an emergency the organism concentrates all its energy for the attack or the flight, as the case may be. A person chased by an angry bull can actually run faster and jump higher than he could under normal conditions. Digestion normally goes on in an automatic way; the smooth muscles of the digestive system contract in a rhythmic manner. When an emergency arouses an emotion, all this stops. Professor Cannon placed a cat, which had just had a meal, in an apparatus that made

it possible to observe the process of digestion. While the digestive activities were functioning in a normal manner, he introduced a dog into the room. The cat, afraid of the dog, gave all the signs of fear; the digestive process stopped altogether and remained suspended for some time after the cause of fear had been removed. The heart is also a smooth muscle going about its work without conscious control, but in an emotional state the action of the heart is speeded up. The increased flow of blood is diverted from the visceral organs to the large muscles of the limbs. In an emotional state the lungs are stimulated to increased breathing. The adrenal glands normally pour a small amount of their secretion—adrenalin—into the blood stream; but, when the person is emotionally aroused, the flow of this substance is greatly increased. The action of this increased supply of adrenalin is to prepare the organism for strenuous action. It aids in the stopping of the digestion; it probably stimulates the liver to release more fuel for the muscles; it helps to increase the circulation of the blood and even increases the clotting power of the blood. What is the significance of all these organic changes? They are preparations for action. They cannot be thought of as the result of emotional experience, but must be considered as a very real part of the emotion itself. An emotion is a wrought-up, disturbed, moved state of the individual, and one part of this disturbed condition includes the organic happenings mentioned above.

4. OTHER EMOTIONS

Although fear and anger are the most important and far-reaching of the emotions, there are other affective states that may be called *emotions* and there are many words that serve as names for emotional states. These various emotional states can be distinguished in terms of the situations in which they occur. Joy is the emotional response to success, surprise to an unexpected happening, grief to loss of a cherished person or object, disgust to an offensive situation, and so on.

These emotional states are not so clear-cut or extensive in their effects as are fear and anger.

Joy is an emotional condition that is aroused by the attainment of some very much desired goal. There is a rather widespread organic reaction that is experienced as an intense feeling of pleasantness or exhilaration. Joy is usually the result of action rather than the motive for action, as are emotions of fear and anger.

The emotion of surprise results from a sudden, unexpected, and unusual situation. This emotion may be a part of the emotion of fear that results from a sudden emergency. Surprise is an emotional state that occurs when the individual is unable to adjust to the unexpected situation at once. This is characteristic of most emotion; the emotion results when there is an inability on the part of the individual to adjust in any adequate way to a present situation. When the individual can and does make an adequate adjustment, no emotion results; but when no such adjustment is possible, the energy released by the stimulus seems to become dammed up and produces rather widespread disturbance.

Disgust is the emotional condition resulting primarily from the taste or odor of filthy or decaying objects. During development, this emotion may spread to anything remotely associated with the primary stimulus. Unsanitary conditions, uncleanliness, obscenities, as well as many other kinds of conditions, become the stimulus for the emotion of disgust.

Grief is the emotional state that results from the loss of something or some person near and dear to the individual. The emotion results because there is no adequate form of behavior to take care of the situation. If we could do anything about it, there would probably be no emotion; but, as no satisfactory activity is possible, emotion is the result.

5. EXPRESSION OF EMOTIONS

A child expresses his emotions fairly clearly in his facial expression; but as the child grows up he learns to moderate

his expressions of fear and anger, joy and disgust. Social pressure demands that he conceal his emotions as much as possible. He is made fun of when he shows fear and reproved when he expresses anger; so he soon learns to hide his emotional states as much as possible from other people. On the other hand, we are continually trying to read the emotions of other people by means of their facial expressions. Social custom dictates that emotions be not paraded in public and yet social custom also demands that we act in accordance with the feelings of other people. As a result, there is a race between concealment of emotions and the reading of emotions.

When facial expression alone is used to determine the emotional condition of others, there is a great possibility of error. Experiments making use of posed photographs indicate that in the case of some emotions it is very difficult to read the emotion from the facial expression alone. In actual life, of course, we make use of a great many other clues, such as the objective situation, what the individual is doing, his vocal expression, words and inflections, gestures, and so on.

6. MOODS

Whereas an emotion is usually of short duration and very intense, a mood is usually of long duration and rather mild. Moods reflect to a considerable extent the organic condition of the individual. Grouchiness, irritability, sulkiness, depression, "blues" may be traced back in many cases to an unhealthy condition of the vital functions of digestion and elimination of waste products. The cheerful, optimistic, happy moods go hand in hand with a properly functioning organism. Moods may result from a previous emotional condition. The white heat of anger may subside into a sullen, resentful, belligerent mood. When he is in this mood the individual is easily aroused to anger again.

Besides the organic condition and the residual effects of a strong emotion, moods may be the result of events and

experiences. Success in any project may produce a mood of cheerfulness and optimism, which may persist for some time, while failure is likely to induce a gloomy, resentful mood.

Moods are closely related to action. Besides being an affective coloring of activity like the feelings to which they are closely related, moods exert an influence on the course of our thoughts and the direction of our actions. Even the character of our perceptions is determined to a considerable extent by the prevalent mood. Perception, as we shall see, is the process of ascribing meaning or significance to a body of sense data. Obviously, the character of the perceiving process is determined to a certain extent by the mood of the moment. The process of imagination and thinking is also determined to a considerable extent by the mood of the individual. If the mood is one of melancholy, the daydreams and imaginations are colored by this condition, while the characteristic train of thought of the cheerful person is of a very different nature.

There is a mutual interaction between the organic condition of the individual and his emotional experiences. The organic condition helps to determine the affective background, and the feeling tone or mood influences the organic condition. Continual worry or emotional excitement are not conducive to a healthy functioning of the vital functions of the individual. An affective coloring of pleasantness and a prevalent mood of cheerfulness exert a tonic effect on the organism.

7. SENTIMENTS

Sentiments are complex emotional states directed toward some specific object or person. Through the course of experience some particular emotional state becomes associated with a particular object, and the characteristic emotional response to that object is fairly permanent. This is called a *sentiment.* The two most prominent sentiments are love and hate. Hate is a complex emotional attitude directed toward

a certain person or object. It is a combination of fear and anger and irritation. Love is also a complex emotional condition centering around a particular person. Patriotism is another example of a complex emotional state toward a particular object. There are many other sentiments, such as religious, aesthetic, and social sentiments, which are highly complex and are all directed toward particular objects. There may be also self-regarding sentiments or emotional states directed toward oneself. All these sentiments have their directing influence on the activity of the individual.

We have dealt in this chapter with the affective background of activity or the experiential coloring of behavior, as well as the radical emotional disturbances to which the individual is subject. In discussing these features of the individual's activity, we have been forced to notice that activity is influenced and directed by these features. This is a part of the larger topic of motivation, which was dealt with earlier. It should be noted again that the emotions, moods, sentiments, and feelings can be thought of as one kind of motivation, or directing influence, for human behavior.

OUTLINE OF THE CHAPTER

Feelings and Emotions

1. Feelings
 —pleasantness and unpleasantness.
 —correlated with attitudes of approach and withdrawal.
 —not fixed attributes of experiences.
 —habits of feeling.
 —influence of organic condition.
 —no known sense organs or organic basis.
 —accompany activity—not separate experiences.
 —change with duration.
 —related to action.
2. Emotions
 —emergency equipment.
 —trained and educated.

—anger—stimulus—interference.
—modified with experience.
—fear—stimulus—sudden emergency.
—learned fears.
—organic condition in fear and anger
—joy.
—surprise.
—disgust.
—grief.
—emotion and facial expression.

3. Moods—mild emotional conditions of long duration.
4. Sentiments—complex emotional states directed toward some particular object or person.

Review Questions

1. Write a note on the relationship between feelings and action.
2. Describe the organic state in fear and anger.
3. How should the salesman take into account the feelings and emotions of his prospects in his job of selling?
4. List some of the ways of reading another person's emotional condition.
5. Indicate how feelings may be considered motives.
6. Comment on the statement: "Anger is not without its value."
7. "Fear is unnecessary." Do you agree? Why or why not?
8. Distinguish between feelings, emotions, moods, and sentiments.
9. How are fears acquired?
10. How can anger be trained and modified?

Chapter IX EMOTIONAL CONTROL

I. INTRODUCTORY STATEMENT

The day-by-day happiness and efficiency of the individual depend on his ability to control and manage his emotional life. His feelings and emotions can make his life miserable or happy, depending on the degree of control that he has achieved over them. The person who swings frequently from extreme elation to deep depression is in need of emotional reeducation. He who is hampered in his activity by a variety of vague but powerful fears could be helped to a happier and more efficient life if the fears were removed. Worry can make anyone not only miserable but inefficient. Emotions are subject to training and education. No one need continue to have hampering fears or an unruly temper. These are a matter of habit, and habits can be changed.

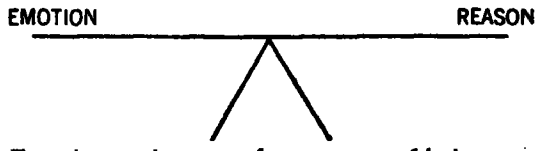
There is a close relationship between health and the emotional condition of the individual. It is difficult, if not indeed impossible, for a person to be healthy when he has unhealthy fears and emotional conditions. Worry, vague fears, and frequent emotional upsets are contributing conditions to some forms of illness. For health and happiness, emotional control is essential

Emotional disturbance is an enemy of efficiency. Emotion and reason form a kind of balance; when one goes up, the other goes down. The more emotional the individual is, the less efficient he becomes; for when emotional disturbance occurs, reasoned, intelligent, efficient action is impossible. Emotional disturbance brings a loss of efficiency in fine muscular coordination as well as in intelligent control in adjustment.

Emotional control is a matter of habit formation; that is, it is acquired. The best time to acquire emotional control is during development. However, if an individual has reached adulthood without such emotional maturity, it is not too late; for to one who really wishes to attain them, emotional control and emotional reeducation are possible at any age.

2. TRAINING IN EMOTIONAL CONTROL

Education of the emotions has been a neglected phase of education, although we are now beginning to realize the importance in guiding children toward an emotional maturity that will help to increase both efficiency and happiness. Training in the management of the emotional life of a person can and should begin very early in development and continue through his growing years. Emotional control does not require the inhibition of emotions or the removal of emotional experiences, but it does imply the harnessing of the energy of the emotions to a useful purpose. Fears can be, and often are, a very real hindrance to efficient living, and most fears should be unlearned. Anger is often a spur to action, but if the anger gets out of control the action that results is not efficient or useful.



Emotion and reason form a sort of balance—when one goes up the other goes down.

a. Removing fears from children.

From experiments, much valuable information has been gathered about children's fears and techniques of dealing with them. The child starting out in life with very few definite fears soon acquires a considerable variety of fears. It is normal for the young child to have fears, but these can be removed as he grows older. Some methods that have

not proved to be very helpful should be mentioned. One such method is the method of disuse; that is, keeping the feared object or situation from the child for some time.. This method has been shown to be ineffective, as when the child experiences the object or situation after such an interval of disuse, his fear is often as intense as before. This indicates that fears, to be conquered, must be faced and adjusted to, as they do not just evaporate into thin air. Another method that has shown poor results is the "familiarity breeds contempt" idea, or frequent contact with the feared object in the hope that the child will become accustomed to it and thus not fear it. But frequent presentation without the child's being helped to adjust in some way to it succeeds only in making the fear more intense than it was before. Another common method, which is actually dangerous, is the method of ridicule; that is, making fun of the child for his fears. This usually causes him to try to hide his fear and, because he thus bottles up the fear without making a satisfactory adjustment, the fear sometimes becomes even more serious than before. Verbal appeals—telling the child there is nothing to be afraid of or that it is silly to be afraid or that there is no cause for fear—do not help the child, as often such statements only succeed in confirming him in his idea that there *is* something to be feared.

A method that has at least occasional success is the method of social imitation. This means that the child is exposed to the fear situation in company with someone in whom he has confidence and who does not show any fear. That is, the child can learn to overcome his fear of dogs, for instance, if he plays with other children who obviously enjoy the company of dogs.

The reconditioning method, if it is carefully used, is usually successful in removing fears. By "reconditioning" we mean that the feared object is presented along with something else, which calls forth a happy feeling and a positive reaction. If skillfully arranged, the happy feeling and the positive

reaction become transferred to the feared object and the fear disappears.

Knowledge and skill are enemies of fear, while ignorance and inefficiency are allies of fear. Many fears—indeed, most fears of children—are irrational and founded in ignorance and lack of understanding and skill. Fears, then, can be combated by the building up of knowledge and skill in adjusting to situations. They should always be brought out into the open, and discussed, and the individual should be helped to make an adjustment to the situation producing the fear. Fear, you remember from our previous discussion, results from the person's inability to adjust easily and quickly to a situation that he has interpreted as being dangerous to him in some way. Training in dealing with fear can, therefore, take two forms—in the development of methods of dealing with potential fear situations, and in the development of a better understanding of situations so that situations will not be interpreted as dangerous when they are not. Fears can be prevented best not by shielding the child from all situations that might produce fear but by aiding him to understand these situations and to adjust to them.

b. Dealing with anger in the child.

Anger explosions in the young child are to be expected. When his environment restricts his activity, and when he does not understand the necessity for such restrictions, or when he fails to get his own way, anger may result. The usual anger expression in the young child is the temper tantrum—kicking, screaming, and an almost complete loss of control. The main thing to be sure of here is that the temper tantrum is not successful, that the child does not influence other people to cater to his wants by this method. This means that the most effective method is to remove either the child's audience or the child himself. He soon learns that he cannot succeed in that way and is helped to discard this method of trying to produce results.

When anger explosions are frequent in the child, it is a good idea to examine his environment. It may be that some of the people in his little world present this pattern of behavior and that he is merely using the method employed by his mother, his father, or his teacher. Also, there may be so many restrictions that he is almost forced to explode in order to feel at all free to express his own individuality. Or he may merely be lacking in sufficient sleep; emotional control is difficult when one is fatigued. There are often underlying causes of the emotional explosion, which should be ferreted out and dealt with. There is very little use in dealing directly with the temper tantrum itself by punishment or any other such method.

The child, as he grows and develops, needs help in learning desirable emotional expression. That is, emotional education gives training not merely in suppressing emotions, but in adjusting to emotion-producing situations and in expressing the emotional condition in a socially acceptable manner.

3. EMOTIONAL ADJUSTMENT IN THE ADULT

There are a number of simple suggestions that may be given to help the adult achieve an effective emotional control. The individual can reduce emotional disturbance by a careful management of his environment so that he may avoid situations that are emotion producing. This suggestion, however, can be carried too far, in that he may hinder his happiness and efficiency by removing from his daily life all emergency situations. On the other hand, there is little sense in torturing oneself by exposure to too many situations that have an emergency or danger quality. It is a dangerous game to play when the individual continually gets himself unnecessarily into situations that are fraught with danger. He may get thrills out of narrow escapes, or thrills from fear-producing movies or books, but these thrills may be experienced at a serious cost to his emotional health.

Another simple suggestion for emotional control is to



Courtesy American Red Cross. Photo by Atkins

Activity helps to prevent or dissipate an emotion. People are afraid during an air raid; but when they have something to do, their fear is lessened.

remember that reason and emotion do not mix. This means that by an emphasis on the rational and intelligent features in any situation emotional disturbance may be avoided. When the individual succeeds in "keeping his head" in any situation he usually succeeds in preventing an emotional disturbance.

Related to "keeping one's head" is the suggestion that activity also helps to prevent or dissipate an emotion. The best example we have of that at present is the situation in the bombed areas of Great Britain. Of course, most people in a raid were afraid, but those who had something to do and did it were less affected by fear than were those who had nothing to do. Activity, especially strenuous activity, provides an outlet for the emotional condition and tends to

drain the emotion off. This, in some simple situations, means that if, when the individual feels fear or anger developing, he can find something to do, the emotional disturbance will not be so serious or so intense. This is even more effective when the "something to do" is closely related to the emotion-producing situation and forms an adjustment to it.

Another way of dissipating a developing emotional condition is to "laugh it off." Laughter is actually an emotional outlet. The young child who explodes in gales of laughter after being thrown into the air and caught, or after being poked in the ribs, is using laughter in its primitive stage; but the principle is the same in most laughter, and certainly the individual who can manage a hearty laugh rarely goes on from there into a state of fear or anger.

4. LACK OF CONFIDENCE AND FEAR OF BEING INFERIOR OR INADEQUATE

A very common personal difficulty, and a most troublesome one, is lack of confidence in oneself. This takes many forms, and is called by a variety of names. The most popular term for it is *inferiority complex*. A careful survey indicated that about 75 per cent of adults have this condition in some form or other. This lack of trust in oneself may be only in a particular situation, or it may be a generalized feeling that is present in all activity. It may be experienced in the realm of knowledge or of learning or in terms of muscular activity of various kinds or in skills and aptitudes or, even more frequently, in social relationships.

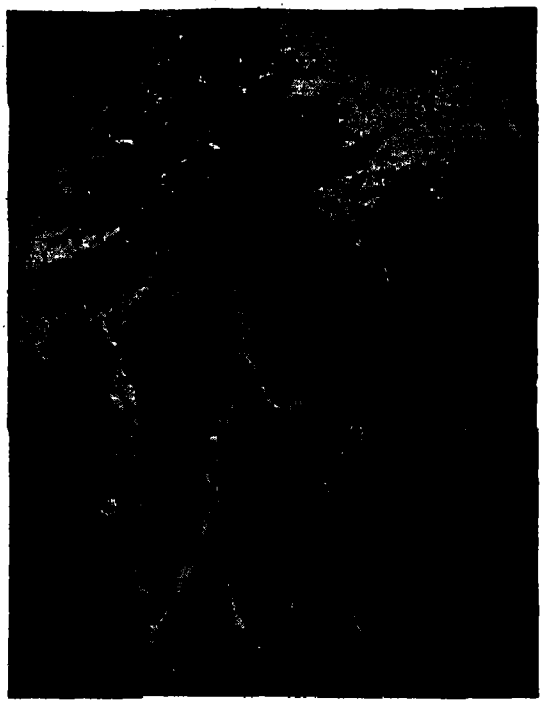
In most cases this feeling of inadequacy has begun in childhood, when the child was made to feel inferior because of his lack of knowledge and experience, as well as of skills. In some cases the feeling of general inferiority disappears when the individual learns more and overcomes his ignorance and inefficiency; but in other cases it continues, even though the person has been successful in acquiring knowledge and skills. The element of competition in education is responsible

to a great extent for the prevalence of the inferiority feelings, as only one in a class can come first, and all except the winners are failures.

A number of simple suggestions may be offered as a remedy for this lack of self-confidence. The first essential is that the individual shall make a fair appraisal of himself. To do this he needs to make an impersonal, objective inventory of his strengths and weaknesses. He must be careful of the standards he uses in making this appraisal. The tendency is to compare ourselves not with the average but with the best. This, of course, is not being fair to ourselves, as it would be very unlikely that anyone could be best in everything. He can assess his strong points and remind himself of those things that he can do better than the average person and those areas of knowledge where he knows more than the average. He can at the same time assess his weak points—things that he cannot do so well as the average and areas of knowledge in which he has little information. Some of these lacks can be overcome by a carefully planned program of learning. Others must be accepted as personal limitations that are known and over which no time and energy should be wasted in regret, because of the realization that everyone has his limitations and that no one can be good in everything.

Often a lack of self-confidence is emphasized by the individual's continually reminding himself of how deficient he is. Such continual self-suggestion only serves to make any individual less able to improve. He needs, therefore, to adopt a new kind of suggestion—a suggestion that he has some personal worth and can do some things well, and that he can improve and intends to improve in some other fields of endeavor. Many are held back from personal improvement by the idea that they just cannot do or learn some things at all. This may be an entirely false idea and, if anyone who has it could only get rid of it, he might be able to improve greatly.

Another valuable suggestion in removing inferiority feel-



Courtesy Northampton School for Girls, Northampton, Mass.
Whole-body exercise helps to build up self-confidence, gives an outlet for energy, exercises the muscles, and relieves pent-up tensions.

ings is deliberately to strengthen the idea of success and arrange conditions so that it is possible to taste the thrill of accomplishment. "Nothing succeeds like success" means that success once experienced, even in a small way, motivates the individual to seek further successes in the same field or in related fields. It is relatively easy to arrange for success, if the individual will set for himself a goal that is possible of accomplishment.

A planned program for the development of special skills in some line of endeavor should help the individual to rid himself of his inhibiting feeling of inadequacy. That is, practically everyone can find some activity in which he can become proficient above the average. He can then feel that there is something that he can do better than nearly everyone else. It does not matter much what the activity is, as long as the individual himself feels that it is something that is worth doing.

And whole-body exercise helps the individual to build up his self-confidence. There is a healthy outflow of energy in exercise that employs most of the large muscles, and this energy expression aids the person in relieving some pent-up

tensions, so that he comes away from the exercise with a healthy mental glow that makes him forget for the time his frustrations and failures. The person who can throw himself wholeheartedly into such exercise as swimming, walking, running, rowing, skating, skiing, or into playing tennis or golf, basketball or badminton, or indeed into almost any exercise that uses his large muscles, has an antidote for his lack of self-confidence as well as a useful outlet for his energies.

No one need allow his emotional life to stand in the way of his happiness and efficiency. Emotions are subject to change; they can be modified through practice. The main thing is to know what your emotional habits are and then to want to improve and to make a determined effort to practice better emotional expression.

OUTLINE OF THE CHAPTER

Emotional Control

The necessity of emotional control
- —for health.
- —for happiness.
- —for efficiency.

Training in emotional control
- —removing fears in children—disuse.
 - —frequent application.
 - —ridicule.
 - —verbal appeals.
 - —imitation.
 - —reconditioning.
 - —skill in adjusting.
 - —increase in knowledge.
- —dealing with anger in children—temper tantrums.

Emotional adjustment in the adult
- —avoiding emergency situations.
- —emphasizing reason.
- —being active.
- —laughter.

Lack of confidence
—prevalence.
—development.
—remedies—self-appraisal.
—self-suggestion.
—arrange for success.
—develop special skills.
—expression through exercise.

Review Questions

1. List and describe methods of removing fears in children.
2. How should temper tantrums be handled?
3. Describe a program to help an individual cure himself of feelings of inferiority.
4. Describe a program to prevent the acquisition of fears by the child.
5. Why should fear not be used in child training?
6. Show how a lack of confidence may be built up by the individual.
7. Using the suggestions given in the text as a basis for your answer, show how the habit of worry might be cured.
8. Make an outline of your own emotional habits and indicate how improvement might be obtained.
9. Comment on the statement: "Emotional control is a matter of habit formation."
10. What is meant by the balance of emotion and reason?

Part III

INDIVIDUAL DIFFERENCES AND THEIR MEASUREMENT

This part of our study of human activity deals with the fact of individual differences. People differ from each other in nearly every aspect of their activity. We will concentrate on two of the most important ways in which these differences are evident—intelligence and personality.

Some of the questions that will be answered are

What is intelligence?
How is intelligence measured?
Are intelligence tests necessary?
In what ways are the tests used?
What is personality?
How does personality develop?
How is personality measured?

Chapter X

INTELLIGENCE AND INTELLIGENCE TESTS

I. INDIVIDUAL DIFFERENCES

THAT people differ is a fact so obvious that we often overlook it. A few casual observations are sufficient to demonstrate that there are great differences between individuals in every characteristic of activity. This obvious fact has been neglected or denied many times in the history of mankind. One outstanding example of the failure to realize the presence of individual differences in activity happened in the eighteenth century in an astronomical observatory in England. The assistant recording the movement of a particular star was found to vary in his record from the man in charge. The assistant was thought to have made an error and was discharged. However, it was discovered later that all observers differed slightly in exactness of records. This was the beginning of the study of what came to be called the *personal equation* in scientific observation and measurement. It became the psychologist's task to study and measure the personal equation. That individuals vary in all characteristics of activity is now a well-established fact.

To indicate the range of individual differences in ability let us look at two examples. John Stuart Mill was reading Greek long before the usual age for a child to start school; and, before he was old enough to vote, he had written several very important books. Contrast with Mill's the case of J. B., who at the age of twenty-one could not calculate the cost of three one-cent stamps and three two-cent stamps, with the stamps before him. Although he had spent ten years in school, he was unable to read anything but the very simplest

selections; he could not tell how many fingers he had on both hands without counting them, and even then he would probably make a mistake. These two examples represent two extremes of ability, and, of course, between them there are all degrees. The difference between individuals in regard to what is usually called common sense, mental ability, and character is enormous; and such differences are very important. What is opportunity to one man is discouragement to another; and, while one is climbing the dizzy heights to fame, the other is wending his weary way to the poorhouse.

The greatest and most common intelligence test is life itself, a test that some pass with honors while others fail miserably. For the most part, adult life does not create these great differences between people. It merely emphasizes them, for these differences exist in childhood, although, because of the protective forces thrown around the child, they are rarely noticed particularly at that time.

People differ in physical characteristics—weight, height, shape of the face, color of the hair, and so on. Individuals also differ greatly in their conscious life, in their forms of imagery, methods of thought, habits of reasoning, and use of imagination. They vary in what they perceive in the same situation. They differ in the efficiency of their sense organs—one person being color-blind, another shortsighted, another stone-deaf, and so on. Great variations exist in the emotional responses of people. While one person seldom becomes angry, another may fly into a rage at the least provocation. One person can learn three or four times as fast as another. Individuals differ greatly in their ability to adjust or adapt themselves to novel situations. Socially, mentally, emotionally, morally people exhibit wide differences.

When we attempt to measure any of these individual differences we usually find that there are no distinct categories in which to place individuals, but that rather there is a continuous gradation of whatever characteristic we are measuring from one extreme to another. Another common

result of measurement of any characteristic of human activity is that the great majority of people are found to be in the middle part of the scale, and also that one extreme tends to balance the other extreme. To put this in another way, there are usually just about as many of those making low scores as of those making high scores, but the majority are near the average. In statistical terms the frequency distribution of such scores resembles a normal distribution.

People have always been interested in classifying others—continually labeling them as dull or bright, able or the reverse, good or bad, good learners or poor learners, good or not so good providers, and so on indefinitely. What psychology has done in this field is to adopt the everyday problem of everyday classification and measurement and attempt to apply exact techniques of measurement and interpretation. Of course, psychology still has much to do in this regard, but attempts to classify people according to ability and other characteristics of activity are gradually becoming more exact and useful.

2. HISTORICAL DEVELOPMENT OF INTELLIGENCE TESTS

The history of the development of techniques for the measurement of intelligence is a long and interesting story, the mere outline of which can be given here.

In early times those who represented extreme diversions from the normal in ability were recognized and labeled fools or were thought to be possessed of devils. At one time, the only treatment given to these individuals was by whips and chains. In the nineteenth century, when a deeper sense of social justice was born, such treatment was forever abolished. When Seguin in France, who believed in the education of the feeble-minded, succeeded in getting some others to believe in it as well, the era of special classes and clinics to deal with the subnormal in ability began. This interest in the feeble-minded created a need for some accurate method of measuring the ability of individuals.

Another line of development came through the laboratories of experimental psychology. With the founding of Wundt's laboratory in Germany a beginning was made in the attempts to measure the activities of individuals. Cattell was a leader in the movement in the United States. Darwin, Spencer, and Galton in England were interested in problems of human heredity and gave an impetus to studies on the measurement of ability.

The child-study movement, with a long historical background in Europe, was initiated in America by G. S. Hall, Kirkpatrick, and others. Again the necessity and desire to measure ability became prominent.

Some of the earliest tests were tests of physical characteristics, such as strength of grip, rate of movement, and so on. Ebbinghaus in Germany was interested in the problems of memory and learning and invented ways of measuring learning and forgetting.

The first real mental tests were probably used by Cattell in 1890, but these tests were rather crude and inaccurate. The Chicago World's Fair in 1893 witnessed Jastrow attempting to measure the intelligence of any who were interested.

Statistical methods, which were destined to play a large part in later research in this field, were invented by Spearman and others in England.

Perhaps the most important single development came from France in the work of one of the leading psychologists of that country, A. Binet. An educational commission to study ways and means of dealing with the children who fell behind in their schoolwork called in Binet and other psychologists. Binet conceived this problem to be one that called for the measurement of ability in order to determine whether the retardation in schoolwork of these students was due to a lack of native ability or to some other cause. He tried out a variety of possible ways of measuring intelligence and finally decided that the most accurate method would be to

select a large number of little tasks and determine which of these could be passed by children of different age groups. Binet's first scale of tests, which appeared in 1905, consisted of thirty small tests arranged in order of difficulty. In 1908 the second scale appeared. In this scale Binet arranged the tests in age groups, and the concept of mental age was adopted. The mental-age method of measurement is based on the idea that there are certain things that an average child of a given age can be expected to do, so that any individual can be said to have the mental age corresponding to the problems that he can solve. The year of Binet's last revision, 1911, was also the year of his death. His work rapidly became known all over the world.

American workers soon translated and revised the scales for use in this country. Goddard produced the first of these scales in 1910. Another revision was made by Herring; but the Stanford revision of the Binet test, made by Terman of Stanford University in 1916, has had the widest use. This is a very valuable test, which has been made even more efficient by a further revision brought out in 1937.

The next step in the development of intelligence testing came in the introduction of group methods of testing. During the First World War, the United States Army testing program was responsible for the production in great numbers of tests suitable for the testing of large groups of individuals at the same time. These group tests of intelligence were great timesavers and made it possible for the army testers to measure the intelligence of several millions of men in the United States Army. In the Second World War, intelligence tests have been used for most of the armed forces of the world as an aid in selecting men and sorting them into the types of unit in which they could make the greatest contribution.

Another development was the introduction of tests that could be used for subjects who had some language difficulty or who were illiterate. These tests made use of concrete

materials and were called *performance tests*. Many varieties of performance tests have been devised and have proved a very useful supplement to the usual verbal intelligence tests.

The success of intelligence tests led to the extension of testing techniques to the measurement of other characteristics of the individual. Tests for vocational aptitude were invented. Achievement tests of various kinds were brought out, and finally tests designed to measure personality characteristics were tried.

3. ARE INTELLIGENCE TESTS SUPERFLUOUS?

It has been suggested by some that intelligence tests are unnecessary, that anyone can tell whether an individual is feeble-minded or normal or bright. This is true to a certain extent, but there is often a need for something more than a rough estimate of ability. Judgments about a person's intelligence are subject to large and serious errors and are often clouded by such factors as likes, dislikes, bias, and prejudice.

If a set of photographs of children ranging in intelligence from feeble-minded to very bright were given to a group of individuals to be ranked in order of intelligence, the resulting judgments would be about as correct as they would be if the judges ranked the children by drawing lots.

If the same judges were given the opportunity of seeing the same children lined up in a room and made their judgments from this chance to observe the subjects, the judgments would be slightly better, but still not very accurate.

If the judges were allowed to interview the children separately for a period and ask them any questions that they wished, the accuracy of their judgments would be increased. If these judges had the opportunity of having the children together daily in a classroom for 6 months, the estimates of ability would be still more accurate. If the judges were given a set of standard tests and were told what the average child of each age could be expected to do on these

tests, the accuracy of the estimates would be increased greatly. This is what intelligence tests aim to do—to give a means of comparing the individual's performance with that of the average or normal child of a given age.

Tests also make it possible to make the judgment or estimate of intelligence quantitative. In any measurement there is the necessity for some standard of comparison. Almost anyone can tell that a 10-foot table is longer than a 3-foot table; but when it comes to finer judgments, some standard of measurement is necessary, such as a yardstick, in order that the judgment may be accurate and reliable. This is equally true in the measurement of ability. Although it may be possible for nearly everyone to tell that one child is brighter than another, there are occasions when it is necessary to make more accurate comparisons, and for this purpose the intelligence test serves as a measuring stick.

The intelligence of retarded children is usually judged to be more than it actually is, because we usually compare that child with the younger children in the same grade, so that an eleven-year-old child may be judged by a seven-year-old standard. The intelligence of superior children is usually underestimated because of the same factor—that of judging them not by the actual age standards but by those of other children belonging to the same grade in school.

It is difficult without tests to distinguish genuine dullness from the mental condition that results from an unfavorable and unstimulating environment. Speech difficulties and other special disabilities often becloud the issue. There is usually a tendency to overestimate the talkative child and to underestimate the quiet, shy individual. These are some of the reasons why intelligence tests are necessary in order that an accurate and reliable estimate of ability may be obtained.

Schoolteachers make use of many different methods of judging intelligence. Success in school examinations, ability to read, knowledge of facts of geography and history, ability to memorize, resourcefulness in play, capacity to adjust to



People have given millions of dollars to phrenologists, fortunetellers, palmists, and such quacks to find out unreliable information about themselves.

Ewing Galloway

new situations, manners, general appearance including shape of the head and expression of the face, tidiness, and many other capacities and characteristics have been used. Most people have very little idea as to what intelligence is, but the majority have confidence in their own ability to size up others. The members of mankind have a perennial interest in their own capacities, an interest that has donated millions of dollars to such quackeries and pseudo sciences as phrenology, fortunetelling, palmistry, graphology, and hosts of others. Intelligence tests are not magic, they are carefully constructed measuring sticks; nor do intelligence tests tell all there is to know about anyone. In order to help an individual, the psychologist needs to know something about

his intelligence, but this knowledge is only one small part of the total picture. The giving of an intelligence test does not imply a suspicion of feeble-mindedness, as some seem to think; but an intelligence-test score is significant, whether it be high or low or average.

4. INTELLIGENCE DEFINED

There are almost as many definitions of intelligence as there are writers on the subject. The difference between these writers is more apparent than real. Binet said that intelligence is the ability to take and maintain a mental set, the capacity to make adjustments for the purpose of attaining a desired end, and the power of self-criticism. This is one of the most comprehensive definitions given and is probably as good as any.

Other definitions may be mentioned briefly. Woodworth defines intelligence as seeing the point, adapting oneself to novel situations, and retentiveness. Dearborn says that intelligence is the capacity to learn or to profit by experience. Terman describes intelligence as the ability to carry on abstract thinking.

These are a few of the many definitions of intelligence that psychologists have formulated. Whether they define intelligence as the ability to adjust or the capacity to learn or the plasticity of the nervous system, all psychologists agree that intelligence is measured by intelligence tests.

5. HOW INTELLIGENCE IS MEASURED

Intelligence is measured through the performance of the individual in a set of definite standardized problems in restricted and controlled conditions. The performance is measured and compared with the average performance of a large number of individuals of the same age. The result may be stated in terms of the mental age, the intelligence quotient, the percentile rank, or some similar measure.

The mental age is an expression of the extent of develop-

ment achieved by the individual stated in terms of the performance that can be expected at any given age. When a person is said to have a mental age of ten years, his performance on the tests corresponds to that of the average ten-year-old child.

The intelligence quotient is an expression of the rate of mental development and is found by dividing the mental age of the individual by his actual chronological age, and multiplying the result by 100 to remove fractions. If an individual's performance was exactly average, his I.Q. would be 100, if less than average below 100, and if above the average over 100.

The percentile ranking states the rank of the individual in the general population in terms of per cent. A percentile ranking of 50 would mean that there would be as many people with higher scores than this individual as there were with lower scores, and a percentile ranking of 75 would mean that there would be approximately 75 per cent with lower scores and 25 per cent with higher scores.

There are many kinds of intelligence tests, but all are based on the same general principle—that of selected problem situations and the comparison of the individual's performance, when faced with these problems, with the average performance. The following classification indicates the kinds of intelligence tests in use:

A. Individual tests in which the subject is tested separately.
 1. Verbal or question-and-answer tests.
 a. Age scales, in which the tests are arranged in age levels.
 b. Point scales, in which definite points are given for each performance.
 2. Performance tests in which the subject is required to handle concrete materials. These may be either age or point scales.
 a. Maze tests.
 b. Picture-completion tests.
 c. Form boards.

B. Group tests in which a number of individuals are tested together.
 1. Verbal—pencil-and-paper tests.
 2. Performance tests.

Let us look in more detail at one of these tests and see how it is used. The test that has been used most in America is the Stanford revision of the Binet scale called the Stanford-Binet intelligence test. Let us suppose that we want to test a boy eight years of age. The first essential is that the person who is to do the testing shall be trained in the testing technique. The boy is taken into a room alone with the tester, and some time is spent in making him feel at home and in removing all nervousness and strangeness. When the tester is sure that the boy is interested and will do his best, the actual test begins. As we have already noted, the test consists of a number of tests at each age level. The test in this case would be started at the six-year-old level. There are six tests at this age; they are, briefly, distinguishing the left from the right, finding omissions in pictures, counting thirteen pennies, comprehension or what's the thing to do in several practical situations, naming five coins, and repeating sentences after the examiner. Each of these separate tests is scored as passed or failed.

In this case we will suppose that the boy has passed all the tests; so, we may go on to the next age level, age seven. The six tests at this age level are as follows: giving the number of fingers on both hands; describing pictures; repeating five digits after hearing them once; tying a bowknot from a sample; giving differences between such things as a fly and a butterfly, a stone and an egg; and copying a diamond. Very definite standards for scoring each attempt are given by the author of the test.

Let us suppose that our subject has been able to pass successfully all but one of the tests given; we then go on to the next age level, age eight. The six tests at this level are as follows: the ball and field test, in which the subject

draws a line to mark out his path in looking for a ball lost in a circular field; counting backward from 20 to 1; comprehension or what's the thing to do; giving similarities between such things as wood and coal; giving definitions for such words as balloon and football; and a vocabulary test.

Supposing that the boy passed only two of these tests, we will go on to the next age level. The tests for age nine are giving the date, arranging five weights in order of heaviness, making change in practical situations, repeating four digits backward, using three words in a sentence, and finding rhymes for words. Our subject has failed on all these tests, so our testing is finished.

Notice the procedure, starting the test at an age level at which we are fairly sure that our subject will pass all the tests, continuing through the succeeding age levels until we come to one where all the tests are failed. Each test is scored as passed or failed, according to definite standards. The scoring of this test would be as follows: The base age is the age level at which all tests are passed, in this case six years. Each test has a value in terms of months, and in our example the boy gets credit for passing five tests at the seven-year level, a total of 10 months; two tests at the eight-year level, a total of 4 months; and no credit at the nine-year level. The mental age is found by adding the base age and the months' credit earned, in this case a total of seven years and two months. This total represents the mental age of the boy. The intelligence quotient is calculated from the mental age and the chronological age as follows:

$$\text{I.Q.} = \frac{\text{M.A.}}{\text{C.A.}} \times 100$$

or

$$\text{I.Q.} = \frac{86 \text{ months}}{96 \text{ months}} \times 100 = 89.6 \text{ or } 90$$

The number of tests and the credit in months for each in the 1916 Stanford-Binet test is as follows: Yr. III, IV, V,

VI, VII, VIII, IX, X,—six tests in each with a credit of 2 months each; Yr. XII—eight tests with 3 months' credit each; Yr. XIV—six tests with 4 months' credit each; Yr. XVI, or average adult—six tests, 5 months' credit each; and superior adult with six tests and 6 months' credit each.

In calculating the I.Q. of any individual whose chronological age is over sixteen, the mental age obtained on the test is divided by 16, no matter how much older the individual is.

This is what is called an *age scale*, where the tests are arranged according to age levels on the basis of the performance of a large number of cases, and credit is given in terms of units of mental age. Another method of scoring tests is the point-scale method, where a certain number of points is given for passing each individual test in the scale and the mental age is determined by a comparison of the individual's score with a set of norms or averages of the scores of a large number of cases at each age level.

The group tests were invented as timesavers. To test a large number of cases by the individual method would require considerable time, whereas by the group-testing method a large number of cases can be tested at one time. In making a survey of a school or any other group, it is valuable to give group tests and then select from the results of this test those cases, either high or low, which require further study and give them individual tests. Group tests are of necessity written tests, the instructions being in some cases given orally and in other cases read by the subject himself in the test booklet.

The Army Alpha group test, given to some millions of men in the United States Army, has been the model for many other group tests constructed since that time. This test consists of eight small tests, each one of which in turn consists of many smaller units. The eight tests are as follows: (*a*) a directions test in which the subject follows complicated oral directions in marking figures; (*b*) a series of arithmetic

Test Type Analogies

DIRECTIONS: In each of the following, the first two words in capital letters go together in some way. Find how they are related. Then write a number to show which of the last five words goes with the third word in capital letters in the same way that the second word in capital letter goes with the first.

1. WATER is to FLUID as IRON is to (1) metal (2) rusty (3) solid (4) rails (5) mines _____

2. PARENT is to COMMAND as CHILD is to (1) obey (2) will (3) women (4) love (5) achieve _____

3. EARS are to HEAR as EYES are to (1) notice (2) recognize (3) observe (4) witness (5) view _____

4. POETRY is to WORDS as MUSIC is to (1) rhythm (2) motor (3) notes (4) melody (5) subject _____

General Vocabulary Questions

1. APATHY means most nearly (1) emotion (2) attitude (3) fury (4) insensibility // // // // //

2. ARGUMENT means most nearly (1) disarm (2) contest (3) augury (4) enact (5) salve // // // // //

3. ARROGANT means most nearly (1) insulting (2) haughty (3) impervious (4) turbulent (5) exhausting // // // // //

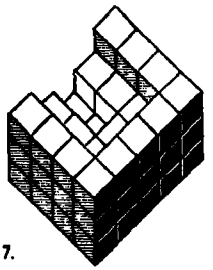
4. ASPERITY means most nearly (1) courtesy (2) acrimony (3) imperious (4) aspersion // // // // //

From "Practice for the Army Tests." Courtesy Arco Publishing Company

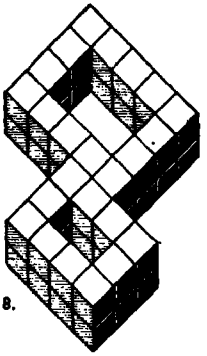
Army tests vary in form (*see opposite page also*), but all of them provide a problem, record the performance, and compare it with the average.

problems; (*c*) a test of common sense, in which a series of questions is given, with three possible answers to each question, the subject being required to mark the most sensible answer; (*d*) a test to measure the ability of the individual to understand the relationship of sameness or oppositeness in the meanings of words; (*e*) a test of ingenuity, as shown in the ability to rearrange words into sentences; (*f*) a test using number series and requiring the subject to continue these series as started; (*g*) a test using analogies in which two words in a definite relationship to each other are given and the subject is required to select a word showing a similar relationship to a given word; and (*h*) a test of ordinary

Cube Counting Items 7 to 12



7.



8.

Test Type Interest Problems

1. To find the interest on $480 at 3½% for 2 months and 15 days. (a) $2.50 (b) $3.50 (c) $3.25 (d) $4.00.

2. Find the length of time it would take $432 to yield $78.66 in interest at 4 3/4%. (a) 2 yrs.10 mos. (b) 3 yrs. (c) 3 yrs.10 mos. (d) 4 yrs.

3. A man wishes to borrow a certain sum of money for 120 days. He goes to a bank whose rate is 6%. They deducted $360 as discount. How much did the man borrow? (a) $5000 (b) $10,550 (c) $15,000 (d) $18,000.

4. One sum of money is invested at 3% and a second sum, twice as large as the first, is invested at 2½%. The total interest is $448. How much is invested at 2½%? (a) $11,000 (b) $11,100 (c) $11,200 (d) 11,300.

From "Practice for the Army Tests." Courtesy Arco Publishing Company

The army tests were devised for testing a large number of cases at one time in a scientific way. To be of greater value, they should be followed by individual tests.

information. Each individual test has a time limit, so that the test measures both speed of performance and accuracy of comprehension.

Performance tests of various kinds were invented as a supplement to the verbal tests and also as a means of testing persons who have difficulty with language, such as foreigners, persons with speech or reading defects, illiterates, and so on. A great variety of materials have been used, but the principle is the same in all—to provide a problem, to record the performance of the individual in solving that problem, and to compare this with the average performance of a large number of cases.

6. RESULTS FROM THE USE OF INTELLIGENCE TESTS

a. Distribution of intelligence in the population.

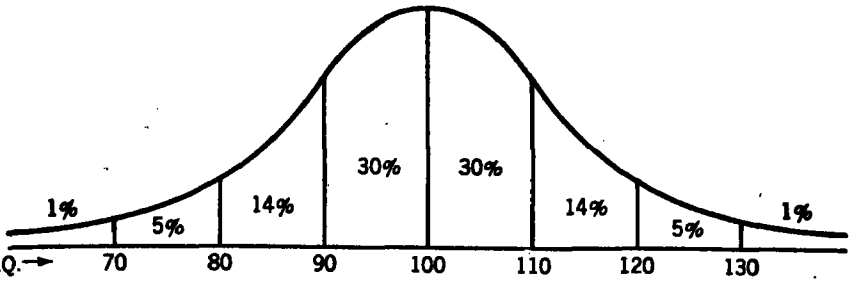
From the results of tests given to many thousands of persons the following distribution is thought to be representative of the general population:

	Per Cent of the Population
I.Q. below 70—	1
I.Q. 70– 79—	5
I.Q. 80– 89—	14
I.Q. 90– 99—	30
I.Q. 100– 109—	30
I.Q. 110– 119—	14
I.Q. 120– 129—	5
I.Q. over 129—	1

About 60 per cent of the total population have an intelligence quotient between 90 and 110, while 20 per cent are below 90 and 20 per cent about 110. Another way of indicating the significance of the intelligence quotient is to give descriptive terms to definite I.Q. ranges as follows:

I.Q. 0– 25—idiot
I.Q. 25– 50—imbecile
I.Q. 50– 70—moron
I.Q. 70– 80—borderline
I.Q. 80– 90—dull
I.Q. 90–110—average or normal
I.Q. 110–120—superior
I.Q. 120–140—very superior
I.Q. over 140—genius

Idiots, imbeciles, and morons are usually called *mental defectives* or *feeble-minded.* These descriptive terms are at best only a very rough means of classification. There are no definite boundaries between the different classes. For instance, an imbecile with an I.Q. of 49 is not significantly different from a moron with an I.Q. of 51; in fact, in a retest their positions may be reversed.



The curve showing distribution of intelligence in the general population indicates that 60 per cent of the people have an I.Q. of 90–110. The other 40 per cent divides itself equally into 20 per cent below and 20 per cent above this I.Q. Note how similar the percentages are as the curve declines on both sides for greater and less intelligence among the remaining 40 per cent.

b. Constancy of the I.Q.

If a child is tested at the age of five can the result be taken as a safe prediction of that child's intelligence at the age of sixteen? A person's I.Q. may rise or decline as he grows older, but only to a surprisingly slight extent. In general, the I.Q. remains at about the same level throughout life, so that a fairly safe prediction can be made regarding the future intelligence of an individual from a test. Retests of hundreds of children show on the average a change from the first I.Q. of about five points up or down, while a change of ten points or more in an I.Q. is an exception and is found very infrequently. There are definite and permanent rises in the I.Q. of individuals who have been relieved from a physical handicap, such as deafness or blindness. A radical change in environmental conditions may cause a very slight permanent change in the I.Q.

c. The growth of intelligence.

Although the intelligence quotient remains fairly constant, there is a continual growth in mental age from birth up to the teens. It is difficult to say just how long this growth in intelligence continues. It is very difficult to obtain samples of the population after the age of fourteen, because

children are then beginning to leave school. For this reason, it is difficult to tell definitely when growth stops. The average of all the scores on the army tests in the United States was less than a mental age of fourteen. However, it seems from studies of development that intelligence does grow beyond the age of fourteen and probably up to sixteen or eighteen.

In the Stanford-Binet test, the assumption is made that growth is complete at the age of sixteen, because in the calculation of the I.Q. for subjects over that age the chronological age of sixteen is used, no matter how old the individual may be. Does this mean that the individual does not improve intellectually beyond the age of sixteen? Of course not; the individual may continue to develop for ten, twenty, or thirty years; but what it does mean is that the ability to solve novel problems is as good at sixteen as it is at forty. The individual may go on learning, acquiring knowledge and skills, and thus developing mentally; but his ability to comprehend and solve new problems has reached its maximum at about the age of sixteen.

d. Is intelligence inherited?

It has been fairly well proved by different methods that general ability or intelligence is inherited. The environment may or may not create opportunities for the normal development of this native power; but no environment can create an ability that is not already possessed by the individual. The children of feeble-minded parents are almost sure to be feeble-minded, and the children of superior parents are more than likely to be bright-witted. Although the inheritance of intelligence has not been proved absolutely, all indications seem to point in that direction.

e. The relation of intelligence and success in life.

Although there is no guarantee that a high intelligence will bring success to its possessor, it certainly is one factor contributing to such success as is attained. The school

child may not be successful in his schoolwork and still may have a normal or above-normal intelligence. There are other factors besides intelligence involved in success in life situations. Motivation and persistence are two of these factors that contribute to success or failure. However, the individual with a high intelligence quotient has a greater chance of success than has the one with an I.Q. below normal. It has been shown by actual study that the average intelligence of people in different occupations differs. For instance, the average intelligence of the professional man is higher than the average intelligence of the mechanic or office clerk. Of course, there are wide variations within each occupation. It can be said that any occupation requires a certain degree of intelligence. A great amount of work still remains to be done, however, before we can determine definitely just what degree of intelligence is required for each occupation. While intelligence is closely related to success in life, it is not the only factor that determines success.

7. USES OF INTELLIGENCE TESTS

Intelligence, as measured by intelligence tests, is obviously an asset in most lines of endeavor. There is a fairly close relationship between the ability of an individual as indicated by the tests and the success of the individual in life situations, but this relationship is not by any means perfect.

In some situations a high intelligence is a handicap, as in the case of the child whose intelligence is such that he can do all the schoolwork expected of him in half the time required by the rest of the class and who thus has plenty of time for getting into mischief and is likely to lose interest in the schoolwork.

The man in an occupation that does not require very much intelligence to carry on may become bored, restless, and dissatisfied. It never pays to put very intelligent individuals into dull, monotonous, routine jobs, because such workers do not stay very long at such tasks and may not even do

them well. On the other hand, the individual whose intelligence is not sufficient to carry on in a particular position may become humiliated by constant failure, may grow sullen and rebellious, and may project his trouble on his employer or on the social system.

The dull boy at school who has been placed in a grade too high for him, because of his size or because of the fact that his former teacher was glad to get rid of him, finds it much more pleasant out of school than in and may soon acquire the truancy habit and drift into other delinquencies. It was not low intelligence that drove him into crime but low intelligence coupled with a social system that demanded from him more than he could give, and thus made things too unpleasant for him in the "straight and narrow path."

We might multiply examples to show that intelligence has much to do with success or failure in making adjustment to life situations, and, in fact, in every department of human activity. It might be of greater value, however, to indicate briefly the major uses to which intelligence tests have been put and some of the important resultant conclusions.

a. The feeble-minded.

The testing movement had its beginning very close to the problem of the feeble-minded. It is natural, therefore, that the testing program should have a very special application to the feeble-minded section of the population. It was thought at one time that the feeble-minded person was very different from the normal individual, that he was a being apart, radically different from the rest of us. One thing that the testing program has indicated clearly is that there are not separate and distinct classes of individuals, but rather that all such classes shade into each other in an imperceptible way. An imbecile is not an individual who is radically different from others, but rather a human being very similar to all other human beings, differing only in the degree of ability to adjust to complex situations.

The feeble-minded individual requires different treatment from that given to others. He is unable to adjust adequately to the complexities of social and vocational activities. He requires a different kind of education from the average. This being the case, it is rather essential that such individuals be discovered early in life. This is possible only by means of tests. Intelligence tests make it possible to give a very precise and definite meaning to the term *mental deficiency*, leaving no room for difference of opinion, personal bias, or prejudice. The usual procedure now is to consider a person with an I.Q. below 70 to be feeble-minded, requiring special training. With the proper use of intelligence tests, feeble-minded individuals can be discovered early in life, and much waste and inefficiency can be prevented. A conservative estimate of the number of feeble-minded in the population is 1 per cent. Feeble-mindedness is a rather important social problem, which has not as yet received the attention that it warrants.

b. In delinquency.

Another social problem to which intelligence testing may be of real assistance is that of the child delinquent. The tendency today in dealing with the child "criminal" is to make a careful study of the child who has been discovered breaking the laws and to attempt to find the cause of the difficulty. The child is not considered a wrongdoer so much as one who is poorly adjusted to life. Intelligence tests aid in this study.

From a large mass of statistics it has been shown that there is a much larger percentage of feeble-mindedness and below-the-average intelligence among the delinquents than among the total population. We may conclude from this that delinquency and low intelligence are in some way related. A typical study of juvenile delinquents by C. Burt may be taken as characteristic of a large number of such studies. He found that, in a group of 107 delinquents between the

ages of six and fifteen, the average chronological age was 13.2 and the average mental age was 11.3, indicating an average retardation in intelligence of about two years. Seven per cent were definitely feeble-minded, 20 per cent were dull, 44 per cent were less dull but still below the normal, 27 per cent were about average, and only 2 per cent were slightly above the average in intelligence.

Delinquents of high mentality are rare, contrary to the popular belief that it is necessary to be clever to be a crook. The juvenile delinquent is typically a dull child; but, of course, not all dull children are delinquent, nor are all delinquents dull. Intelligence testing, although it does not tell the whole story, is making a real contribution to the problem of the delinquent child.

Persons with an intelligence below the normal are more likely to get into trouble than are brighter individuals. Society has failed, up to the present time, to make adequate provision for these individuals. It is not low intelligence alone that causes young people to get into trouble, but low intelligence coupled with inadequate educational and recreational facilities to care for them. Low intelligence is a handicap in complex social situations and such individuals need a great amount of help in solving their problems. Poor emotional adjustment and poor treatment and discipline in the home are also contributing factors to delinquency, especially when they are combined with low intelligence.

Adult delinquency presents much the same problems as juvenile delinquency, but we are much slower in adopting scientific methods in the treatment of such cases. In a survey of the people in a number of large prisons in the United States it was found that about a quarter of the inmates were definitely feeble-minded. Perhaps some day in the future we shall really come to grips with this important social problem and the criminal will be treated as a mentally sick person. When this happens, intelligence tests will play their part in the discovery of the causes of crime.

c. In the educational system.

It is natural that one of the most important uses of intelligence tests is in the schools. There are a number of reasons why it is necessary to classify students according to ability. A very worth-while beginning has been made in giving differential treatment to the dull child in school. Intelligence tests are necessary in order to determine whether lack of progress in schoolwork is due to a lack of ability or to some other reason, and to detect the child with a low intelligence early, before he has wasted much time and effort in a vain attempt to carry on with the ordinary school routine.

There are as many children above the average in intelligence as there are below the average. This group has not yet received the attention that has been given to the training of the dull child. There is great waste in our present-day educational systems. The superior individual lacks opportunities and direction for proper development. Just as the subnormal child has been cared for in special classes and curricula, so some special treatment is needed for the superior child, as well. We have seen that lack of intelligence may be conducive to delinquency and poor social adjustment. Likewise, the bright child whose progress in school must keep pace with that of the slower pupils may present a problem. A boy with an I.Q. over 130 was brought to a juvenile court with a long list of housebreaking and robbery charges against his name. This boy was able to do the required schoolwork in about half the time needed by the other pupils, and, as a result, he had plenty of spare time. All might have been well but for the fact that his mother felt that he should not take part in the usual activities of the boys of the district, and he was not allowed to belong to any clubs or teams. With plenty of spare time and nothing to employ it, and with the stimulus of enthralling detective stories, the boy was soon launched on a very real criminal career.

The so-called problem case in the school requires a very thorough study. Intelligence tests serve as one part of such surveys. In fact, for the proper treatment of the school child, intelligence tests are indispensable and should be a routine matter in all schools.

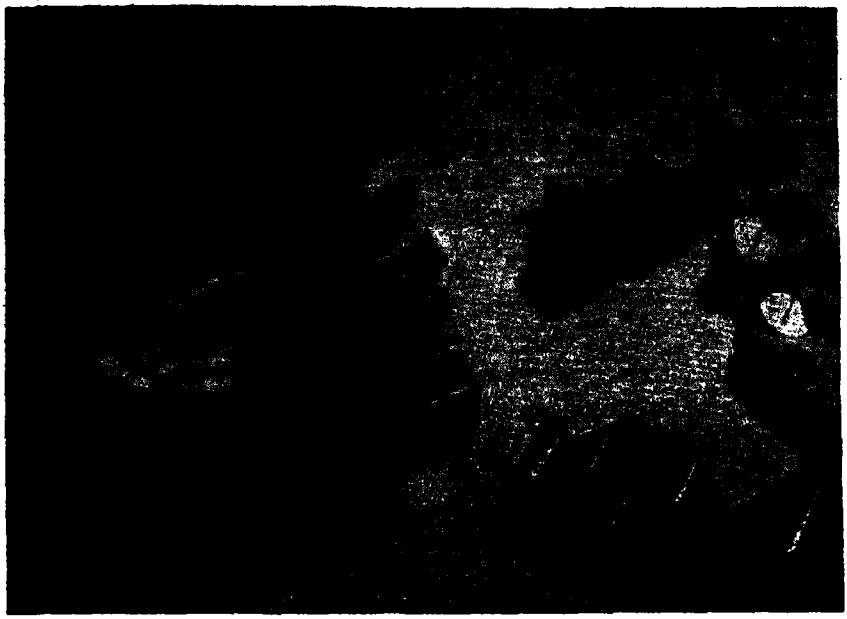
Educational guidance is possible only if there is accurate measurement of the ability of the child. The intelligence-test score serves as a basis for the estimation of the kind and amount of work that the child can be expected to do. Intelligence-test scores would assist in deciding just how long it would be worth while for a child to continue his educational career. Suitable courses of study can be selected by means of a careful measurement of the ability and aptitudes of the child. In the higher forms of education, tests may be valuable in the selection and elimination of candidates for university and college courses.

d. For vocational guidance.

Educational guidance is a part of the larger problem of vocational guidance. Vocational guidance is the attempt to direct individuals into the types of occupation in which they will be most likely to be successful. This implies a knowledge of vocations and the degree of ability required for these vocations. Our knowledge of the level of intelligence required for each occupation is very incomplete as yet. When we do know definitely the degree of intelligence required for success in various occupations, we shall be able to direct individuals into the lines of endeavor in which they will have the greatest chance of success. Vocational guidance is much broader than mere intelligence testing, but intelligence testing can be of real assistance in such a program.

e. For special groups.

Intelligence tests are useful in making surveys of special groups of persons, such as the deaf, the blind, the immigrant, and racial groups. The results of testing a large number of



Courtesy Human Engineering Laboratory

Two of the aptitude tests given by the Human Engineering Laboratory to help in placing people in their proper vocations are the wiggly-block test (*top*) to determine structural aptitude and the test for tweezer dexterity (*bottom*)—a necessary aptitude for surgery and other lines of science.



Courtesy Human Engineering Laboratory

deaf and blind individuals with special tests indicates that such sensory deficiencies reduce the average level of intelligence. The blind and the deaf are characteristically less intelligent than are the normal. In countries such as Canada and the United States, where immigration is fairly continuous, the use of intelligence tests to select those individuals who will have a greater chance of success in the new land seems to be the sensible procedure.

f. In industry.

Tests—sometimes intelligence tests and sometimes other tests comparable to intelligence tests—have been used as a help in the selection of individuals for particular positions. The usual method is to try out the test on persons already engaged in the job. If the test differentiates between the successful and the less successful, it can be used in selecting other individuals for the same task. Tests are very useful here, not as the sole basis of selection, but as a very useful supplement to other methods, such as the interview and the application form, on which data on previous experience and education and other matters have been gathered.

We have now indicated some of the major uses of intelligence tests. The list is not by any means complete, for these tests can be used in any situation in which it is necessary to obtain some definite measurement of capacity. There are a number of precautions that should be mentioned for the use of intelligence tests. Intelligence tests should be administered by those who have been trained in their use. Care should be exercised in the interpretation of a test result. Tests are by no means perfect and test scores are therefore not to be considered as absolutely reliable, although they may be considered as a much more accurate measure of ability than any other method yet invented. We should not expect a test to tell us all there is to know about the individual. Intelligence tests have their limits of usefulness. There is far more that we need to know about the individual besides his I.Q.,

in order to make any decision about his educational, vocational, or environmental direction. Intelligence tests are only a small part of a psychological examination. In the next chapter we will indicate other characteristics of the individual's activity that may be measured or at least estimated.

OUTLINE OF THE CHAPTER

Intelligence and Intelligence Tests

1. Individual differences.
2. History of the development of intelligence tests.
 —early beginnings.
 —Binet and individual tests.
 —army testing program and group tests.
 —performance tests.
3. Measurement vs. estimates of intelligence.
4. Intelligence defined.
5. Intelligence measured.
 —kinds of tests.
 —measures of intelligence.
6. Results from intelligence testing.
 —distribution of intelligence.
 —constancy of the I.Q.
 —growth of intelligence.
 —inheritance of intelligence.
 —intelligence and life success.
7. Uses of intelligence tests.
 —feeble-minded.
 —delinquency.
 —in schools.
 —vocational guidance.
 —in industry.
 —special groups.

Review Questions

1. Are intelligence tests necessary?
2. How would you define intelligence?
3. Outline as many uses for intelligence tests as you can think of.

4. Contrast individual and group tests, verbal and performance tests, age scales and point scales.
5. Compute the intelligence quotients in the following and indicate what each I.Q. signifies about the individual:
 a. M.A. 6 years 2 months; C.A. 12 years 4 months.
 b. M.A. 7 years 6 months; C.A. 7 years 2 months.
 c. M.A. 13 years 3 months; C.A. 9 years 1 month.
 d. M.A. 14 years 6 months; C.A. 28 years.
6. Make a list of the ways in which people differ from each other.
7. Describe Binet's contribution to the development of intelligence tests.
8. How would you define M.A.? I.Q.? What does a M.A. of 10 years 2 months mean? What does an I.Q. of 102 mean?
9. What is meant by the constancy of the I.Q.?
10. Describe ways in which intelligence tests may be used to advantage in the educational system.

Chapter XI

PERSONALITY AND ITS MEASUREMENT

1. WHAT IS PERSONALITY?

THE term *personality* is used in a number of ways and is often given a rather indefinite meaning. However, psychologists have narrowed these definitions down to two: (*a*) the effect that the individual has on other people and (*b*) the total pattern of habits of thinking, feeling, and action, including attitudes, interests, likes and dislikes, aptitudes, and abilities. The latter use of the term is adopted in our discussion. Personality, according to this definition, is a rather inclusive term, taking in the total make-up of the individual at any time, and is moreover far from static or fixed. In fact, we think of personality as being subject to change and improvement.

2. THE DEVELOPMENT OF PERSONALITY

To understand the personality of an individual, it is necessary to study "how he got that way." As personality is not fixed and permanent, it follows that heredity plays a small part in its development. It is rather the day-by-day experiences of the individual, the kinds of environment in which he has developed, and the opportunities for all kinds of learning that have made him what he is today. We will describe four main types of influence that may have their effect in shaping the personality of the individual in development. They are physique, chemique, social factors, and learning.

a. Physique.

Although physique—appearance, strength, body build, size and proportion—has no value as a clear indication of

what the individual's personality is, it may have an indirect effect on the development of his personality. For instance, a boy who is small for his age and who has been subjected to daily suggestions that he should eat more in order to grow up into a "big, strong man like Daddy" may begin to place an inordinate emphasis on size and physical strength and, because he is smaller than others, may feel that there is something wrong with him, that he is different or inferior. Because he thinks this of himself, he may develop attitudes and compensations that will make him a different kind of person than he might otherwise have been. A girl who has not fair, curly hair, but who sees adults making a great fuss over girls who have, may also wonder if anyone can like her with her straight, dark hair. Any deviation in size, strength, shape, appearance, etc., may lead the individual to have distorted ideas of his effect on other people and thus develop personality characteristics as the result of what he thinks other people think of him. So, physique has its indirect effect on personality development, even though there is no direct relationship between any physical characteristics and personality make-up.

b. Chemique.

By "chemique" we mean mainly the possible effect of the endocrine glands on personality development. In the main, it would appear that as long as these glands are functioning normally their effect on personality is slight. However, when any one of the glands fails to function in a normal manner, it may have an indirect effect on behavior and personality. The thyroid glands have an effect on the metabolism of the body. When they produce an oversecretion, there is a tendency for the individual to be irritable, restless, and "on edge." In case of insufficient secretion, there is a tendency for the individual to be slow, "lazy," and sleepy. The pituitary glands are intimately related to body growth, and malfunctioning of the glands may produce

excessive growth. The adrenal glands are related to the emotional behavior of the individual. The gonads produce, through their secretions, the secondary sexual characteristics. Much still needs to be discovered about the effects of these and other endocrine glands on behavior and personality, but at present it seems safe to say that their effect is probably slight, except when there is some glandular imbalance or when some gland is over- or underfunctioning.

c. Social factors.

Too much stress on the importance of the social factors in personality development is impossible. The individual has the personality he possesses mainly because of the kind of social environment and social experiences he has had during his development. The kind of family in which he grew up, the teachers in the schools he attended, the people in his community, his playmates, and indeed all people with whom he came in contact have left their imprint on him. He has been striving for a "place in the sun," for social security, for a feeling of belonging, for status; and the form that this striving has taken and the success or failure of his attempts, all have their effect on his developing personality. Some social contacts are, of course, more important for personality development than are others. The intimate and continuous contacts with members of his immediate family usually have the greatest effect. However, the nature of the play gang, the type of teachers he has had, and any dramatic social contacts are also very important.

d. Learning.

No situation can be overlooked in an attempt to account for the personality development of the individual. In fact, every experience that he has leaves him a slightly different person. Some experiences have an effect that must be considered more than slight. Human beings are by nature learning organisms—that is, they are changed or modified

because of the experiences they have. In some cases, a book, a casual comment, a motion picture, or indeed almost any kind of experience can be the turning point in development, starting a train of thought and action that may have far-reaching effects on the personality development of the individual.

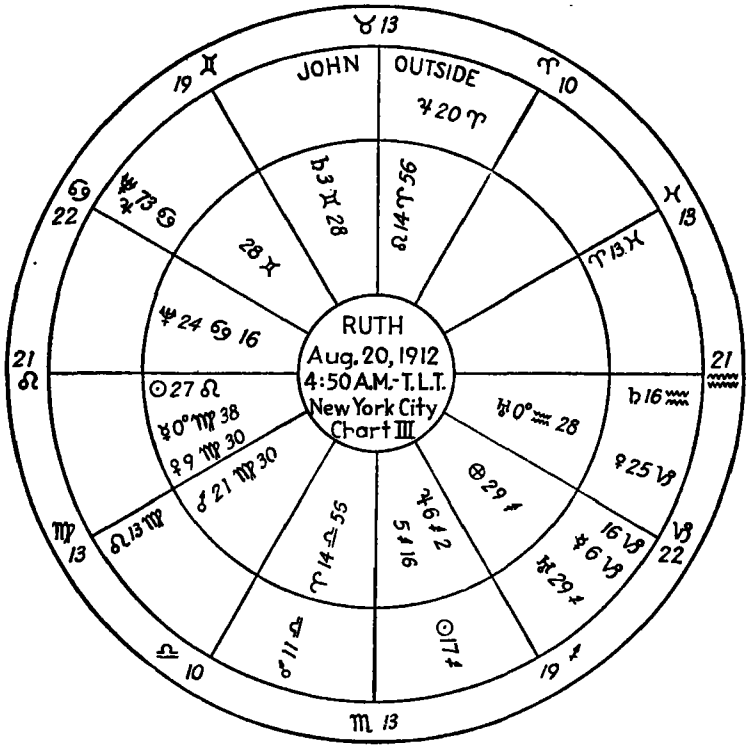
3. CAN PERSONALITY BE MEASURED?

One of the most persistent attempts of man has been to understand his own character and personality and the characters and personalities of others. For centuries men have been trying to solve the riddle of character reading and prediction. Fortunetelling in all its many phases is always prevalent. In this so-called enlightened age, millions of dollars are spent every year to have the future read. Systems of phrenology, physiognomy, graphology, palmistry, and so on, never fail to sell. However bizarre, illogical, or impossible the system of character reading may be, there are always those who are ready to believe in it, even to the extent of paying money to have someone tell them what they already know.

Attempts at fortunetelling and fortune prediction have been many and varied from very early times. Magic, incantation, ritual, and sacrifice were all used in order to produce a beneficent future. Curses, petitions, the wearing of charms, and all kinds of ceremonials were supposed to influence personal fortune and character. All this is not past history, by any means, for many remnants of this primitive magic and superstition persist today.

An advance was made from this early stage when man recognized that physical events and personal characteristics followed laws that are beyond the power of personal desire and magical rites. Instead of trying to produce changes in events and personality by ceremonials, men attempted to discover signs and clues that would tell what the fortune of the individual was likely to be. Astrology,

with its crude attempts to outline personality characteristics and individual fortune from the position of the stars, is one example of such attempts. The hour and date of birth, such physical characteristics as lines of the hand and shape of the head, and many equally unrelated factors have been



Some people are well able to decipher this chart but are puzzled by such a simple process as voting. Astrology is a crude attempt at outlining personality characteristics and individual behavior but has no scientific basis.

used as indications of the personality characteristics of the individual. Such factors are not only useless but misleading, and one cannot be too emphatic in denouncing systems of this sort. Our everyday conversation is full of examples of the persistence of superstitions and beliefs that are supposed to influence the course of human lives and help in the discovery of the proper course of action.

As knowledge develops, we are slowly moving toward another stage. We are gradually coming to realize that these early methods are of little or no value and so we are beginning to study the actual behavior of the individual and attempting to apply measuring techniques to the complicated activity of the individual.

It is easy to describe individuals. We look at a child in school and say that his hands are dirty or clean, that his clothes are tidy or untidy, that he is neat, or slow, or honest; but such description has very little value. In order to be of real significance, description should have a standard or norm. A child whom we would call slow in comparison with some other children might be fast in comparison with still others, and a worker who is industrious when compared with one group would be considered lazy or indolent when compared with others. Any description of an individual, to be useful, must not be limited to single events or occasions. It is impossible to judge the skill and efficiency of a salesman by the results of one sales interview, in which he may or may not have been successful. In order to pick out a satisfactory employee, a good wife, a mayor, or any individual for a particular position, it is necessary to know something about the more or less permanent tendencies, habits of thought, feeling, and action that characterize him or her.

Measurement is one kind of description. When we measure we describe, but the description is always in terms of some standard of comparison and usually in numerical terms; that is, the description is in terms of degrees of more or less. Measurements are always of some part of the whole, never the total. The measurements of a table tell only part of the story of the table. We may go on measuring the table in many ways—its length, width, thickness, height, hardness, weight, smoothness, and so on, almost indefinitely. This is true when we come to measure the infinitely more complex thing that we call *human personality*. No one measurement can be sufficient to give a complete picture.

We are continually passing judgments about others. These judgments are usually in terms of extremes. We label individuals as honest or dishonest, but it is just as incorrect to use such labels as it is to describe all tables as either large or small. In other words, personality characteristics are matters of degree and amount, just the same as the size of a table is. Just as there is a continuous scale of intelligence and an individual may be placed anywhere along that scale, so with such personality characteristics as honesty and industry, there are degrees, and an individual may be placed anywhere along an honesty scale, from absolute honesty to absolute dishonesty. The crudest form of description here would be, then, to describe an individual as either honest or dishonest, while a finer scale would include such terms as never honest, seldom honest, sometimes honest, usually honest, always honest. A still finer measurement scale would give some numerical value, such as honest in ten out of fifteen sample cases.

The measurement of personality characteristics is still to a considerable extent in an experimental stage, although rapid progress has been made during the last decade. It will not be possible to describe in detail in this book the many attempts that have been made to measure the various personality characteristics. All that we can reasonably do is to outline some typical examples of the various methods and hope that those who are interested will go further in the study by extra reading.

4. METHODS OF PERSONALITY MEASUREMENT

There are three main methods of measuring personality characteristics. The first method assumes some relationship between anatomical structures and activity, and therefore measures physical features. The second method consists of estimates and ratings. This is really an attempt to make subjective impressions as reliable as possible. The third

method is the use of objective test situations. We will consider each one of these methods in turn.

a. The determination of personality from anatomical structure.

One of the earliest attempts to make use of structure in order to determine personality and character traits was phrenology. Phrenology had its beginning over a hundred years ago in the work of Gall and Spurzheim, and was later popularized by the Fowler brothers. Phrenology is based on the assumption that personality characteristics are located in particular parts of the brain and that an overdevelopment or an underdevelopment of that part of the brain means that that particular personality trait is also over- or underdeveloped. This assumption is absolutely ungrounded in fact. There is no such localization of personality characteristics in the brain.

A further assumption is that the development of a part of the brain would be indicated by a corresponding development of the skull. This, again, is not true. Another assumption, equally ill-founded, is that if one individual is seen to possess some particular personality characteristic in a large degree and he also has an overdevelopment of some part of the skull, it follows that anyone with such a skull development will possess that particular characteristic of behavior. The basic assumptions of phrenology have all been experimentally disproved. We have devoted this much space to phrenology merely because there are still enough people who take it so seriously as to make it a profitable business.

Character analysis by means of other physical characteristics is still with us, even though carefully conducted experiments have shown that there is no fundamental relationship between the shape of the face or the color of the complexion and personality characteristics. Systems of physiognomy and systems of character analysis based on blond and brunet types have all yielded negative results when subjected to carefully controlled experimenta-

tion. Lombroso's criminal types based on physical characteristics have not been able to stand the searchlight of experimental inquiry. In general, it can be said with a fair degree of certainty that physical structure cannot in any way be taken as an indication of personality.

b. Rating methods.

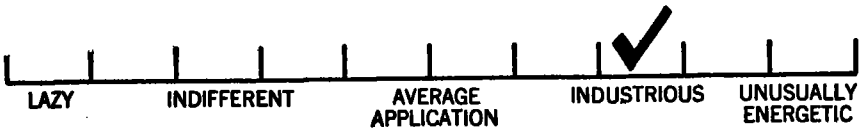
One of the earliest methods of measuring characteristics of activity was the rating scale. This is a technique designed to make estimates of personality characteristics a little less subjective and a little more accurate than the usual estimate or judgment about individuals. Rating methods are used extensively in large industrial and financial establishments, as well as in educational systems, to assist in making and tabulating estimates of individuals for purposes of promotion, transfer, and so on. Symonds lists the following advantages of ratings:

They are an aid in administration.
They stimulate the person rated.
They react in a favorable way on the person doing the rating.
If periodically given, they help keep alive the personnel spirit.
They help to make judgments analytical.
If systematically given, they tend to make judgment representative.
They are a means of getting data for research purposes.

Almost any personality characteristic may be used in a rating scale. The tendency has been to use a wide variety of personality traits in one scale, but there is a limit to the number of characteristics that can be included in a scale and still keep it reliable and usable.

Ratings are always imperfect; but when they are carefully made and when certain necessary precautions are observed, they are much better than the hit-and-miss snap-judgment methods that they are designed to replace. For personality features for which there are no objective tests the rating method is useful.

There are a number of ways of constructing a rating scale. The simplest form of rating is simply to rank the individuals of a group in order of merit in a particular trait. This method does not admit of the comparison of individuals from different groups, nor is it applicable with any degree of reliability to a large group. Another rating method is the man-to-man comparison scale, such as has been used in the United States army to rate officers on various characteristics. Another rating method is to use descriptive phrases. For instance, if you were rating an individual for a trait like leadership, your judgment would



In many rating scales for industry, descriptive phrases are used and the scale is divided into units. A check mark is placed along the line in the unit which best describes the worker's energy and application day in and day out.

be aided by such phrases as: probably unable to lead his fellows, satisfied to have others take the lead, sometimes leads in minor affairs, sometimes leads in important affairs, displays marked ability to lead his fellows. The rater would be required to check the descriptive phrase that best described the individual being rated.

The graphic rating scale is still another type. The rater checks along a line, which is supposed to represent degrees in the trait from one extreme to another. Sometimes the line is divided into units, and the rating may be assisted by descriptive phrases placed along the line. An example of one unit in a graphic scale used to rate workers is given above.

c. Objective methods.

Although rating scales may be useful in some situations, wherever possible they should be replaced by more objective

methods of measurement. There are four major classifications of methods of objective measurement of personality characteristics, which we will consider in turn.

1. The measurement of personal-history facts. The usual methods of obtaining personal-history data to be used in making an estimate of the individual's personality are the interview, the application blank, and the case-history method. The interview method of obtaining estimates of personality is notoriously inaccurate and incomplete; it can hardly be called an objective measurement method. However, there are certain features of the interview that are subject to improvement and standardization. The inaccuracies of testimony, memory, and the force of suggestion from the form of the questions used tend to make the interview method of gathering information of slight significance.

The application blank is another method of gathering personal data, and closely related to it is the questionnaire to be filled in by acquaintances of the individual. Such forms usually require great care in their construction, so that the information obtained may be both as objective and as reliable as possible.

A number of studies of such information and its bearing on success have been made. For instance, one study scored in points the following items of information about life insurance salesmen and then compared these scores with success: age, number of dependents, amount of previous income, previous occupation, number of changes in position during the last five years, amount of selling experience, number of investments, amount of life insurance, percentage of income saved, amount of education and length of time since completion, business or correspondence courses, membership in organizations, number of offices held. The results showed that, of those with low scores, 10 were successful and 38 failed; of those with middle scores, 43 were successful and 47 failed; and, of those with high scores, 47 were success-

ful and 15 failed. All the items in this summary could be objectively answered; that is, there was no room for subjective judgment, as the questions could be answered in terms of fact.

Such information may be of real value in getting an estimate of the individual. What is required is careful study of the relation of the various items to actual life success, and then scoring the presence or absence of that characteristic in the personal-history schedule.

The third method of gathering personal-history data is the case study, which is a comprehensive history of the individual. The case history is just as good and no better than the methods used in gathering the data. The kind of information included in a case study depends on the aim or purpose involved. If the aim is to make a complete psychological study of the subject, every factor that may have any significance is included. The heredity, the physical constitution, the educational history, the developmental history, intelligence, special abilities, such environmental factors as the home and the community, habitual activities, companions, behavior characteristics, emotional stability, reputation, ideals, ambitions—these are some of the factors that are studied. Usually the study is made for a particular purpose, in which case the number of factors included may not be so comprehensive.

2. Physiological changes as personality indicators. Some personality characteristics may be studied indirectly through visceral behavior. The personality factor that has received special attention from this approach is emotion. There is a very close relationship between emotional characteristics and physiological processes. However, as yet physiological measurements cannot be used as measurements of emotional traits, but are considered merely as indicators of temporary emotional states. The chief physiological indicators of emotion that have been studied are heart rate and pattern, blood volume, blood pressure, breathing changes, psycho-

galvanic reflex, and metabolic changes. These physiological changes have been employed with a certain degree of success in the measurement of lying and deception.

3. The study of personality through verbal behavior. In studying personality characteristics through the spoken or written verbal responses of the individual, it is assumed that such responses may be taken as an indication of basic personality traits. There are many kinds of personality tests making use of verbal behavior, of which the more important are association tests, question and answer tests, attitude scales, and tests of knowledge and judgment of social and ethical values. We shall look briefly at each one of these in turn.

Association tests are of various kinds and have various uses. Continuous free association, where the subject is started on a train of reverie and continues until he can go no further, has been used by the psychoanalysts as a means of indicating what they call *complexes*.

Another kind of free association test is that in which the subject is given a stimulus word and responds orally with the first word that "comes into his head." Kent and Rosanoff, using a standard list of 100 words, gave this test to 1,000 subjects and tabulated the replies, so that they would have a measure of the "commonness" of the reply to each of the stimulus words. This test can be used to get at emotional difficulties, as well as to study the general character of the associations used by an individual. That is, by a comparison of the individual's responses with the responses of the 1,000 cases, it is possible to discover whether the individual characteristically gives individual responses; if so, it is assumed that he is introverted.

Another kind of association test is the Rohrshach test, which consists of a series of ink blots, some of which are in colors. The subject is shown these ink blots and his interpretations of what they represent aid in discovering something about his mental habits. Association tests have been used as indicators of emotional complexes, as a means of

detecting lying and guilt, as an aid in diagnosing insanity, as a measure of ability, and as a measure of interest.

The question and answer type of personality test has had a wide use in the last few years. A number of such tests have been produced, designed to measure a wide variety of personality traits. The individual is studied by being asked questions relative to his beliefs, wishes, likes, interests, tastes, preferences, choices, feelings, fears, and worries. Such tests are usually pencil and paper tests, in which the subject either marks one of a number of answers to a given question, or answers in terms of yes or no, or marks the statement as true or false, or employs some comparable method of indicating a reaction to a set question or statement.

We shall have to content ourselves here with the mere mention of a number of typical verbal tests. The Woodworth Psychoneurotic Inventory is a set of over a hundred questions to which the subject answers either yes or no. This test is useful in classifying and grouping individuals in terms of ability to make adjustments to life situations, and in serving as an indicator of difficulties in such adjustments. A number of revisions and adaptations of this test have been made by other investigators. The Pressey Cross Out tests are a series of tests designed for the measurement of emotional characteristics. In these, the subject is required to cross out words that refer to unpleasant things, to things that he considers wrong, to things about which he has worried, and so on. Introversion-extroversion tests have been designed by Laird, Marston, and Heidbreder. Allport and Allport constructed a test that was supposed to measure what they called *ascendency* and *submission*, and which may be valuable in the measurement of one feature of leadership. Bernreuter adapted several tests into one scale, which he called a *personality inventory*. This scale may be scored in four ways to yield a measure of neurotic tendency, a measure of self-sufficiency, a measure of introversion-extroversion, and a measure of dominance-submission.

Although these tests are still in the experimental stage and require more work before they can be taken seriously as measures of personality traits, they have already demonstrated their usefulness in planning vocational placement, in studying the adequacy of educational procedures, and in determining which individuals are maladjusted and require further study and advice.

The study of attitudes by means of verbal responses has had considerable success. Following the work of Allport, Thurstone has perfected a method of measuring attitude that has given reliable results. By an elaborate statistical procedure a scale is constructed. This scale is composed of statements bearing on the subject toward which the attitude of the individual is to be measured. Each one of these statements has a numerical value, and the subject is required to mark those statements with which he is in agreement. In this way attitudes toward a wide variety of subjects, such as particular nationalities, war, God, religion, motion pictures, corporal punishment, and many others, can be measured.

Tests have also been designed to measure interest toward various occupations and activities. Perhaps the most important of these attempts are those of Freyd and Strong. Strong's Vocational Interest Blank may serve as a very useful instrument in the guidance of boys into the line of work in which they will have the greatest probability of success. Strong has found that "members of each occupational group have characteristic likes and dislikes, which distinguish them from other occupational groups," and also that "these vocational interests are present in college freshmen and are not materially altered by technical training and subsequent professional experience."

It is possible to measure knowledge and judgment of ethical and social values by means of verbal tests. One method employed is to test the vocabulary of the individual in relation to knowledge of words with a moral connotation.

slang, etc. A test of good manners has been constructed, in which the knowledge of standards of courtesy and good manners is measured. Numerous tests of Biblical knowledge and information have been designed. Moral-judgment tests of various kinds have also been used. These tests are, at best, but an indirect means of discovering basic character and personality traits and tendencies. A person may know what is right and yet act in a very different manner; likewise, he may not accept intellectually a moral code, yet in actual practice may live up to it. Tests of actual conduct are perhaps much more reliable than tests of knowledge and judgment about conduct.

d. The study of personality through tests of performance.

The most obvious method of measuring conduct is by a direct record of actual performance. However, this method has a number of difficulties to overcome. In testing intelligence, the measurement of ability is in terms of performance on certain set problems; but the use of performance to measure a personality characteristic such as honesty requires a certain amount of maneuvering. Arithmetic problems can be used not only to get a measure of arithmetic ability, but also to determine whether a child would cheat if given the opportunity, or to test the preference of children as to working alone or with others. It is necessary, in using performance as a means of measuring personality characteristics, to keep the subject unaware of the attempt to measure such features. In measuring intelligence or learning ability, the subject is aware of what is being done and tries to do his best, while, in the measurement of honesty or any other character or personality feature, it is necessary that the subject be kept in the dark about the project, because what is desired is not a picture of what he can do but what he actually does.

Hartshorne and May have conducted a rather extensive study of conduct and used a wide variety of test situa-

tions. The results of this study have been published in a number of volumes, and can only be indicated briefly here. In their book, *Studies in Deceit*, Hartshorne and May describe the various tests they used in the measurement of cheating, stealing, and lying, which they conceived to be the three kinds of deceit. Tests of cheating included copying when given the opportunity; the duplicating technique, in which original answers are recorded secretly on the answer paper, the subject being given an opportunity to change his answers when he is marking his own paper; the improbable-achievement technique, or a test that cannot possibly be done honestly, in which a high score would indicate cheating; the double-testing technique, in which the subject is asked whether he can do certain things and then is actually tested on them. Tests of stealing were designed in such a way as to give a chance to steal money and other objects; but, unknown to the subjects, conditions were arranged so that the stealing could be accurately detected. Tests of lying used by Hartshorne and May were pencil and paper tests, in which the subjects answered questions. Some of these questions were designed to get a measure of lying to avoid disapproval and others to measure lying to win approval.

Another personality trait that has been subjected to objective measurement is suggestibility. The degree to which the subject either follows suggestions that are contrary to fact, or resists suggestions, is measured in various test situations. Persistence is still another personality characteristic that has been measured with objective test situations. Fernald made use of the simple test of the length of time a subject can stand on his toes. When he used this test to compare a group of reformatory prisoners with a group of high-school boys, he had rather striking results. The average persistence of the prison group was less than 15 minutes and that of the high-school group 36 minutes. The highest score among the prisoners was less than an hour, while the

highest score among the students was over two hours and a half. Other ingenious tests of persistence have been invented, such as a maze impossible of accomplishment, persistence being measured in terms of the length of time that the subject will keep trying; the use of two different and difficult puzzles, with persistence measured in terms of the length of time spent on the first before trying the second; and monotonous tasks, such as simple additions.

Other performance tests have been designed to measure cooperation, service, inhibition, caution, speed of decision, aggressiveness, and studiousness. Examples of some of these may be found in *Studies in Service and Self-control*, by Hartshorne, May, and Maller.

All these tests of performance are too new and relatively untried to be evaluated. It may be that they will fulfill a very important need in the measurement of personality, but it is also possible that they may have to be discarded as unreliable.

Personality is a very complex thing and very difficult to analyze and evaluate. However, a real beginning has been made in the scientific study of this feature of human activity. The term itself has had a great variety of meanings and should be given a more precise definition. By "personality" the psychologist means the total habits, attitudes, and permanent behavior tendencies of the individual. Some of these habits can be described and some can be measured with some degree of definiteness and accuracy. Although a real start has been made, much remains to be done before the measurement of personality characteristics can be considered to have acquired a practical and usable method.

OUTLINE OF THE CHAPTER

Personality and Its Measurement

Personality defined.

—the total habits of thinking, feeling, and action.

Personality development.
—physique—indirect effects.
—chemique—the endocrine glands.
—social factors.
—learning.
Personality measurement.
—from anatomical structure.
—rating scales.
—objective methods—personal-history facts.
—physiological changes.
—verbal behavior.
—performance.

Review Questions

1. How would you define personality?
2. What are the more important factors influencing the development of personality?
3. List methods of measuring or estimating personality traits.
4. Mention situations in which personality tests would be useful.
5. Using the information from the text as a basis, describe your own personality.
6. Outline some of your own childhood experiences and assess their effect on the development of your personality.
7. In what situations are rating scales of value?
8. Why is phrenology discarded as a method of estimating personality?
9. What is the relationship of physique to personality development?
10. Show how the family situation may influence an individual's personality development.

Part IV

RELATIONS WITH OTHER PEOPLE

One of the most important adjustments that an individual has to make is that of living with other people. Nearly every important human situation is a social situation. This is true in both work and play. The mental health of the individual depends to a great extent on the success of his social adjustment.

Some of the questions that will be answered in this section are

How can one learn to get along well with others?
Is successful marriage an accident?
Can psychology help solve social problems?
How should one go about selecting a vocation?
How should a person be selected for a job?
What are the causes and remedies of industrial unrest?
Can mental health be achieved? How?
Can mental disorder be prevented?

Chapter XII

SOCIAL RELATIONS

1. INTRODUCTORY STATEMENT

GREAT advances have been made in the last century in the management of the material part of our world. We have learned how to use materials so as to add to our comfort and convenience; but we have not made corresponding advances in managing social relationships. This is not because human relationships are so much more complex than radio waves, for instance, but because we have not given enough attention to the business of living with others. Even a superficial study of the world in which we live would indicate clearly that human beings fail quite frequently in this important job of getting along with one another. Look, for instance, at marriage and estimate how many are successful in this human relationship; or look at business and see how often difficulties arise because people have not yet learned to work together very well; or look at the larger scene, with the recurring wars and rumors of wars among the nations of the world.

Effective human relationships are possible. True, to be successful in our social relationships, we need to study and practice; but human conflict and disagreement is not inevitable. In this chapter we will examine a number of illustrations of effective human relationships and the factors involved. First we will look at some general principles and then we will see how these principles work in some specific situations.

2. GETTING ALONG WITH OTHERS— PRINCIPLES OF EFFECTIVE HUMAN RELATIONSHIPS

To get along well with other people—parents, children, neighbors, friends, roommates, business associates, etc.—

it is necessary to take into account a number of basic features of human nature. Every person wants to feel important. Every person dislikes being made to feel small and unimportant. Everyone is striving for a place in the sun. Everyone wants to be liked and thought well of. These simple facts should help us to understand why we sometimes succeed and sometimes fail in our contacts with others. Examine your failures and successes, and you will probably realize that you were successful when you made it possible for the other person to satisfy his desire for importance and you failed in social effectiveness when you denied the other person the chance to have at least some of the spotlight. Keeping this in mind, we can work out a number of simple suggestions for effective social relationships or practical rules for getting along well with others.

a. Be genuinely interested in other people.

People are the most interesting part of our world, and so it should not be difficult to be interested in them. Without a sincere interest in others it is impossible to get along very effectively with them. A genuine interest in others means that you forget yourself for the time being, that you listen to what they have to say, that you show your interest in what they are doing and thinking and feeling. It is always pleasant to have someone take a real interest in what you are saying, doing, or feeling; and this atmosphere of pleasantness makes it possible to start off in the right direction. Effective social relationships are based on mutual liking and respect, and liking and respect are possible only between those who have interest in each other.

b. Avoid creating a feeling of inferiority.

Try to put the other person on an equal level with yourself or on a higher level. This seems to be just the reverse of our usual practice, which is to lord it over the other person

if possible, to make him feel small by making ourselves appear important. This is why we so often lose out in our social relationships; for when we emphasize our own importance, we cannot fail to make the other person seem less important, and this of course is far from pleasant or satisfying to him. Thus there is a wrong tone about the whole situation. If, however, we can forget for the time being our desire to be the important person and allow the other to assume a superior position, we succeed in getting along with him. Our training has been such that most of us are selfish; that is, we put our own desires and feelings first, and because of this we tend to fail in our attempts to live happily with friends, wives, or neighbors.

c. Use sincere appreciation.

This is one method which rarely fails in getting desired results. A sincere word of praise, a pat on the back, makes the recipient glow with pleasure. We are usually too stingy with our words of appreciation, partly because we are thinking too much of ourselves and not enough of the other person. If we truly think that someone has done something well, we should never hesitate to tell him so; but unless the commendation is sincere, the word of praise will be entirely hollow and ineffective.

d. Eliminate criticism and disapproval.

Many social contacts are spoiled because the individual thinks it is necessary to criticize or disapprove of the other person or his behavior. Criticism always implies that the person criticizing thinks himself better than the other person, that he placed himself on a higher level than the other person. Criticism is usually unnecessary; we can get along better without it. Moreover, it rarely accomplishes what it is designed to do, for no one can profit by something that he resents.

e. Let the other person correct his own errors.

Most people realize that they make mistakes and usually know what the mistakes are; but, when someone else points out these mistakes, it acts as a challenge to defend them rather than an incentive to correct them. At the same time, a rather unpleasant feeling arises toward the person who called attention to the mistakes. To point out mistakes to anyone serves to make him feel small and unimportant, to put him on a lower level; and, when this happens, we cannot expect to get along well with him.

f. Never try openly to make other people over.

No one likes to feel that he needs to be reformed. Everyone knows that he is not perfect, but he does not like to think that someone else is trying to correct his imperfections. Many a bride has started in the wrong direction in her married life because she has been indiscreet enough to indicate that she thought she could make her husband over. It may be all right for the bride to believe that by marrying the man she can help to reform him, but it is always a mistake to let him know it.

g. Cultivate the habit of sympathy.

By "sympathy" is meant "feeling with the other person." To sympathize, one imagines how the other person feels and feels the same way oneself. The successful individual in social relationships is the person who has learned to consider the other person's feelings, to know how he feels about things, and to take this knowledge into account. He respects the other person's feelings and never does anything to make him feel resentful or hurt. He has learned how to "feel with" others.

h. Cultivate the habit of tolerance.

Tolerance is the ability to appreciate the other person, whether or not his religious or political views are the same

as one's own, and whether or not he happens to be of the same race, nationality, or economic status. Tolerance does not imply accepting the beliefs and opinions of others, but it does require that we shall not cut ourselves off from association with others just because they happen to be different in some ways from ourselves.

i. Remember that all persons are different.

No two persons are exactly alike. What works with one does not necessarily work with another. Each should be treated as an individual with his own peculiar personality. This means that we should take into account individual differences and not expect that everyone will have the same likes and dislikes, the same desires, the same interests as everyone else. We respect the other person's interests and do not think that there is something peculiar about him because he happens to like different things from those that we like, or have different ideas from those that we have.

j. Check first impressions.

Guard against first impressions and snap judgments of people. First impressions are often highly inaccurate. It is possible to take a violent dislike to a person on the first meeting, for no very good reason—perhaps, merely because the color of his hair or the shape of his nose recalls vague memories of someone else whom we had cause to dislike. It is better to reserve judgment about an individual until you really know him. Better yet, it is desirable to look for and find in every person you meet some good point that can form the basis for a liking.

k. Think more of giving than of getting.

Think of friendships and social relations in terms of contributing rather than of getting. We are more successful in social relationships when we think of what we can contribute rather than of what we can get from them. It is so

easy to slip into the habit of looking for advantages for ourselves that we often spoil social relationships in this way. It is much more effective to think in terms of what we can give, what we have to offer to the social situation. Then we are not continually worried lest someone step on our toes or violate our rights, and we are thinking in terms of the other person instead of our own personal desires and profit.

These suggestions have a solid foundation in psychological fact and have been verified in practice many times by many persons. They should enable anyone who seriously tries them out to be more effective socially and to find greater enjoyment in social contacts.

3. SUCCESSFUL MARRIAGE

Marriage is a social relationship into which most human beings enter. That all marriages are not successful is obvious, and that the percentage of failure in marriage is rather high is also evident. Research is gradually accumulating information indicating the factors that contribute to success or failure in marriage. Although there is much still to discover, it is possible at present to point out some of these important factors.

One fact that is clear is that success or failure in marriage is not dependent entirely on what happens after the marriage ceremony, but that there are features of the previous experience of the two parties that are also important. The picture of the development of the heterosexual affections of the individual from early years must be considered. The relationship between the child and his parents and the kind of attachments built up then may contribute to marital success and happiness. For instance, a strong attachment toward the parent of the same sex or a strong aversion toward the parent of the opposite sex may make it difficult for the individual to attain a healthy, normal, heterosexual development. The character of the sex education that the

individual has received also makes a difference in his marital adjustment. For instance, because of a faulty or an inadequate sex education, the individual may develop an idea that sex is vulgar, shameful, nasty, or fearful; thus, he has a poor start in this important intimate social adjustment. Or he may have learned to separate love and sex and think of them as separate and apart and again have difficulty in making a satisfactory adjustment. Another feature of this development is the kind of impressions that the individual gains about himself during childhood and adolescence—ideas as to what other people think of him or, at least, what he thinks others think of him, which may either help or hinder his adjustment in marriage. Also, the daydreams, brought about by books, motion pictures, stories, conversations, etc., which the individual has about his future partner or about what marriage means may have their effect on the marital adjustment. Any sex experiences, such as exhibitionism or masturbation, may leave their mark on the individual. The effect of such experiences is detrimental mainly because of the feelings of guilt or sin that the individual has rather than any direct effect from the experience itself.

Another feature related to success or failure in marriage is the adequacy of the courtship period. Courtship is a valuable preliminary to marriage, for it is a period of preliminary adjustment during which the two individuals explore each other's emotional life, likes and dislikes, and personalities. They test their compatibility by social, mental, and emotional intimacy. They learn about each others' habits, ideals, attitudes on religion, family life, politics, etc. Without an adequate courtship period, success in marriage is not so assured.

It has been shown that similarity of interests and attitudes on recreation, religion, table manners, care of children, the handling of finances, and related matters is conducive to marital success. When there is too great a difference in these matters there are more chances for disagreement and

discord. Also, similarity in personal characteristics, such as temperament and character, gives a greater chance of success than does extreme difference between the two individuals. Similarity in educational and cultural background is also better than differences in these factors, for nationality and religious differences tend to lead to difficulties. The same principle holds for economic status. A history of happy family relationships and normal affection for parents is another factor related to success. These are not the only factors in marital success, but they are some of the more important ones. The principles outlined in the previous section on getting along with others can be applied to the marriage situation in particular.

4. THE APPLICATION OF PSYCHOLOGY TO SOME SAMPLE SOCIAL PROBLEMS

The solution of most social problems involves a knowledge of human nature and conduct. Poverty, unemployment, delinquency and crime, industrial unrest, and war are some of our more serious social problems. Although psychology has not complete answers to these problems, psychological methods and knowledge can be of use. Let us look at one sample social problem, that of delinquency, and see in what ways psychology can be of help.

The juvenile delinquent is a boy or a girl who has been discovered stealing, damaging property, or exhibiting some other such behavior that is contrary to law. The delinquent is an individual who has failed to learn the right things and who has been successful in learning some of the wrong things. He is behaving in a way that he thinks will bring him the greatest satisfaction. He is, in fact, satisfying some of the same wants that a nondelinquent child satisfies in more acceptable ways. He is not greatly different from other children and will not necessarily or inevitably become an adult criminal. However, if the tendencies to behave in an antisocial manner are not redirected, he will continue on

the wrong path and his delinquency may develop into serious crime.

Many studies of the juvenile delinquent have indicated some conditions that tend to produce delinquency. An inadequate environment and inadequate training and supervision sum up most of these conditions. Poverty, defective marital relationships of the parents, broken homes (one parent missing), bad companions, lack of adequate recreational activities, and other related conditions have been shown to be much more frequent among delinquents than among nondelinquents. In any large city there are areas in which delinquency is much more prevalent than in other areas of the same city. An examination of these areas indicates a poor environment for the active child—crowded living conditions, lack of playgrounds, little equipment for games, and a rather poor kind of commercial amusement. By far the most important factor in delinquency, however, is the kind of persons with whom the child lives—his parents and neighbors.

Low intelligence in itself is not a cause of delinquency; but low intelligence along with an environment that is arranged for the person of average intelligence can help to produce the delinquent. Two cases may be mentioned that may be considered typical of many others. The first is that of a boy whose intelligence would classify him as borderline; that is, an I.Q. in the seventies. He starts going to school and is expected there to do the schoolwork at the same rate as the other children. He is always the slowest in the class and the one with the most mistakes. He is the classroom dunce. He soon learns to hate school because he can never do as well as the other children; and soon he starts falling behind and finds himself with children younger than himself. Staying away from school occasionally, he becomes a truant and his career of delinquency has begun. Playing truant, he finds companions who are also truant, and they, in looking for something to do, find that they want

things they haven't got and soon start stealing. Perhaps he is caught by his parents, who punish him for his behavior, and he runs away from home and gets into more trouble. He is a delinquent not merely because he is dull in intelligence but because his dullness is not taken into consideration in arranging his education and activities.

The other case is that of a boy of very high intelligence who is not allowed by his proud mother to associate with other boys or to take part in club activities. His need for activity goes unsatisfied until he discovers ways and means of deceiving his mother and taking part in all kinds of adventurous activities, such as housebreaking and car theft. He is a delinquent not because he has a high I.Q., but because his high intelligence is not taken into account in providing him with satisfying activities.

Delinquency can be prevented, and in most cases the delinquent can be cured of his criminal tendencies. Prevention is easier and more economical in the long run. Prevention involves providing for every child an environment suitable to his best development. This means seeing that every child has decent living conditions, provision for play, and a chance to take part in healthy and satisfying group activities. It means providing for every child a chance to feel secure and wanted. It means supervision by individuals who understand the needs of the child; and it means schools and teachers who can provide an educational system that is adequate for the dull and the bright, as well as for the average child.

Methods of dealing with the child when he has become delinquent are designed to discover the causes of his present condition and then to go about the job of removing these conditions or providing a new set of conditions, so that he can learn what he had failed to learn before. Punishment is not the best method of dealing with the delinquent, for punishment often makes him even more set in his delinquent ways. Therefore, the modern juvenile court provides the





Top, courtesy U. S. Housing Authority; photo by Sekaer. Bottom, courtesy Federal Works Agency

The best way to curb delinquency and crime is by preventing it. Prevention involves providing the child with a suitable environment for his interest and development.

facilities for studying the individual child and arranging a course of treatment designed to reeducate him. The success of such a program for juvenile delinquents may lead eventually to similar methods for adult criminals. They, too, need study and treatment more than they need punishment.

Psychology has been applied with great benefit in other types of social problems. We will merely mention a number of such areas of application without going into detail. There is the problem of immigration, which would benefit from psychological method and knowledge. There is the problem of the bettering of the intelligence of the nation, of the relationship between moving pictures and morals, problems of education, propaganda, public opinion and its measurement. These and many other related problems have profited from psychological method and information. In fact, any problem involving human nature and conduct is a problem about which the psychologist can have something to say.

OUTLINE OF THE CHAPTER

Social Relations

1. Getting along with others.
 —a genuine interest in other people.
 —put the other person on a higher level.
 —use sincere appreciation.
 —eliminate criticism and disapproval.
 —let the other person correct his own errors.
 —never try to make the other person over openly.
 —cultivate the habit of sympathy.
 —cultivate the habit of tolerance.
 —remember all people are different.
 —guard against first impressions and snap judgments.
 —think of friendship in terms of contributing rather than getting.
2. Successful marriage.
 —early development—relationship to parents.
 —sex education.
 —social development.
 —daydreams of marriage.
 —sex experiences.

—adequate courtship.
—similarity of interests, etc.
—history of happy family relationships.

3. Juvenile delinquency (a sample social problem).
—causes.
—prevention.
—cure.

Review Questions

1. Select five important suggestions for getting along with others and indicate how they might be applied in your everyday life.
2. Show how early experiences of the individual might affect his adjustment in marriage.
3. Take an example from your own experience of a pronounced success in social relations and try to determine why you succeeded.
4. Analyze one of your failures in social relations to try to determine the cause of the failure.
5. In what ways could success in marriage be increased?
6. Select some social problem and indicate how psychology could help in its solution.
7. What are your views on the prevention of juvenile delinquency?
8. Why are first impressions of other people liable to be unreliable?
9. Show why tolerance is essential for effective social relations.
10. Why is a genuine interest in other people basic to successful social relations?

Chapter XIII

VOCATIONAL ADJUSTMENT

1. INTRODUCTORY STATEMENT

ONE of the most important adjustments that the individual has to make in life is in the world of work—finding his place and adjusting happily and efficiently so that he may be able to make his best contribution to life. This is an adjustment that many fail to make very satisfactorily. A survey of any large industry or business would indicate that a fairly large percentage of the workers are not happy in their work, and in many cases not particularly well suited for the work that they are doing. In this chapter we will indicate how psychology can be applied to two major vocational problems—vocational selection and vocational adjustment.

2. VOCATIONAL SELECTION

Vocational selection has two main aspects—the selection of a job by the individual and the selection of an individual for a job by industry. Actually, these two are the same problem, involving the same general principles and requiring both the appraisal of the individual and the analysis of the job. We will look at these two steps first and then consider vocational guidance, which is designed to aid the individual to find the most suitable kind of work for himself, and finally look at employment methods designed to help find the best person for a particular job.

a. The appraisal of the individual.

This is the attempt to obtain a picture of the individual so as to be able to guide him into a vocation or decide

whether he is suitable for a particular position. This appraisal may be made by the individual himself or it may be made by someone else—a vocational guidance expert or an employment officer. There are a number of important features that should be included in this appraisal. The following are among the more important of them.

1. *Ability*. Some measure of the individual's general ability should be obtained. One simple method is to use a good intelligence test. Another way is to examine his academic progress to discover whether he progressed at a normal, retarded, or accelerated rate in his schoolwork and also what point he reached in the school system. His grades, failures, and successes should be examined, as well as the age at which he attained the various grades. Besides his general ability, some indication of special abilities should also be ascertained, such as mechanical, mathematical, artistic, musical, or other abilities.

2. *Education and training*. A picture of the education, both general and special, that the individual has had is necessary also. How far did he go in school? What special training has he had? What are the possibilities for further education?

3. *Personality*. What is he like? What personality characteristics are prominent or absent? What about his emotional maturity and stability? Is he socially competent? What are his assets and liabilities as far as temperament is concerned? These are some questions that should be answered in getting the necessary personality appraisal. This part of the picture can be obtained either by means of tests such as were mentioned in a previous chapter or by ratings and estimates made by persons who know him well.

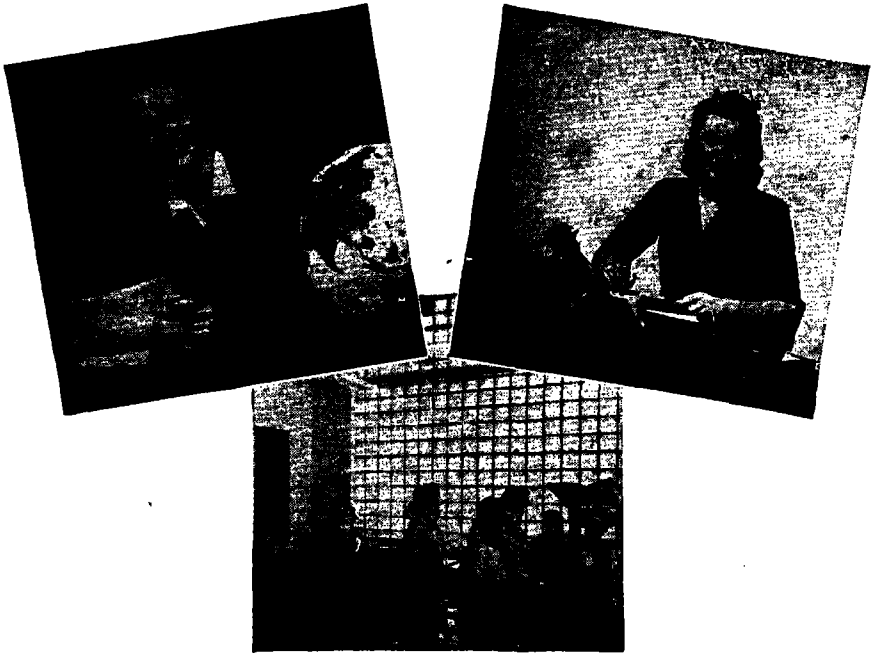
4. *Interests*. This individual appraisal would not be complete without a picture of the individual's interests. Here we need to know what types of things he is most interested in and likes doing, and what kind of activities he dislikes and thus avoids. This picture can be obtained

WHAT VOCATION WILL YOU CHOOSE TO FOLLOW?



Courtesy Wright Aeronautical Corporation, United Air Lines, and J. C. Penney, Inc.

Three of the many vocations for men (*above*) are those of the technician, the airplane pilot, and the salesman. Girls have a more limited field from which to select a vocation; but teaching, office work, and laboratory work (*below*) are a few of the possibilities.



Ewing Galloway, American Telephone and Telegraph Company, and Commercial Solvents Corporation

by finding out how he has used his spare time, what hobbies he has had, what kinds of books he reads, and what choices he has made. Interest tests such as the Strong Interest Blank should also be helpful.

5. *Health.* A record of his health, both present and past, is also valuable because some kinds of work require a rather high degree of physical stamina. A brief history of the sickness he has experienced, the time he has lost from school or work, should give part of this picture, although a complete physical examination by a physician is always valuable.

To aid in making a self-appraisal for vocational purposes, the following list of questions should prove of some help.

Have I thoroughly enjoyed any subject I have studied? What studies have I most enjoyed? Have I done extra work in any subject? If so, why was I specially interested in that subject?

What type of books interest me most? What section, other than fiction, interests me in the library? What are the subjects of the public lectures that attract my attention?

To what extent did I buy and sell and trade with others? Was I successful in such business ventures or did the other boys usually get the better of me?

What, if anything, have I built with tools? Do I do good work with tools? In such work do I delight in accuracy and precision or does anything go?

To what position of responsibility have I been appointed at school, college, or other authorities? Why was I appointed? Why was I not appointed to such positions as I desired?

To what positions have I been elected by my fellows? To what desired positions have I failed to be elected? Why? How well did I fill the offices? Am I recognized as a leader by my associates? Why or why not?

Do I like to be in the limelight or do I prefer to be behind the scenes? Do I get more pleasure out of following or leading? Is it easy for me to get followers?

Am I always just to others? Do I give the praise and encouragement to others that they deserve?

To what extent do others give me their confidence? their loyalty?

To what extent do others seek my advice? To what extent am I able to help others straighten out their difficulties?

Do I like to work alone or with others? Am I able to cooperate in a common activity with others? To what extent do I incline to be helpful and sympathetic to others?

Do I worry over the difficulties and results of my work? Am I sensitive to the opinions of others? Am I irritated easily by the criticisms of others?

Am I able to suggest ways of doing things to others without antagonizing or offending them? Do I like to be with people much of the time? Am I confident and at ease in the presence of others or am I easily embarrassed?

Am I able to speak before large groups of people? Before small groups? Am I able to hold the interest of the audience? Can I express my thoughts readily in writing?

Can I evaluate plans, projects, schemes easily? Can I visualize the possible results of plans of action? What successes have I had in making clear and definite plans and objectives?

Do I enjoy detail work? Do I need a boss to make me be thorough and accurate?

What kinds of activities have I been most interested in? Have I an especially interesting hobby? Why am I interested in this? What vocation is it mostly related to?

b. Job appraisal.

Another essential in a vocational selection program is job appraisal. If the individual is to make a wise selection of a vocation it is necessary for him to know considerable about a number of kinds of work. Some of the features about vocations that should be known are these:

1. *The education required.* It is relatively simple to discover what general and specific education is required for most vocations. As a rule, they require a certain level of general education and some special training.

2. *The general ability required by the job.* It is a disadvantage to have either too high or too low general intelligence for a job. When the individual has more intelligence than is required by a particular vocation, he usually becomes discontented very quickly; and, of course, if he has not as much ability as the job requires, he will soon become a misfit or a failure in that job.





Top, courtesy Blair Academy, Blairstown, N. J. Bottom, courtesy Northampton School for Girls, Northampton, Mass.

Vocations in music and art, as well as in mechanics and mathematics, require special talents.

3. *The special abilities or aptitudes required.* Some vocations require a special talent—musical, artistic, mechanical, mathematical—or at least good sensory equipment. For instance, color blindness is a detriment in many vocations.

4. *Physical and health requirements.* Obviously, some vocations require a physical and health standard to fall short of which will lead to failure.

5. *Personality and temperament.* Certain personality characteristics are an asset for some jobs and a drawback for others. For instance, a salesman requires a particular kind of personality, including a tendency toward extroversion and dominance.

6. *Interest patterns.* Interest is an important feature of vocational placement. It is better for the individual to have the kind of interests typical of the successful members of a vocation that he is choosing.

7. *Satisfactions offered by the vocation.* One feature of vocations that should not be overlooked is the kind of satisfactions that the various jobs supply. This includes income, social position, chances for creative activities, opportunities for advancement, chances for initiative, etc.

c. Vocational guidance.

Much has been said and written about square pegs in round holes, and many people have formed the idea that there is just one perfect vocational niche for each person. This is not true. There are usually not one but a number of places where an individual can fit into the world of work; but no job exactly fits any individual. Jobs and people do not exactly fit. There are always features of a particular job that may be suitable for the individual, but there are always some features that do not suit his personality, likes, interests, or abilities. The problem, then, is to help the individual to find a place where he can be happy and where his peculiar make-up will allow him to make his best contribution; but he should not expect to find a perfect fit.

Vocational guidance should be guidance, not steering, of the individual. The most serious danger is that the counselor will try to tell the individual what he should do. A person makes his best vocational adjustment when he feels that he, himself, has selected his field of work. Guidance can help to provide the chances to find out about the kinds of jobs there are to do and what those jobs are like and what they require of the individual and what they offer to the individual. It can also help the individual to make an appraisal of himself—can provide tests, for instance, for general intelligence, special aptitudes, and personality characteristics—and help to interpret the results of these tests.

Vocational guidance is better when it takes place over a fairly long period of time—years, in fact—and is not confined to just one interview. That is, much can be and should be done for the boy and the girl during the early school years to provide them with information and firsthand experience with a variety of kinds of work. A person can make a wise and intelligent vocational choice only when he has had sufficient experience and knowledge about a large enough variety of kinds of work.

d. Employment methods.

When we consider employment methods, we are considering the reverse aspect of the same general problem. Here the industry is trying to find the best person for a particular job. To do this, it is necessary to know first what the job demands of the individual in the way of abilities, education, personality, training, experience, etc.; then, to have some way of appraising the applicants so as to discover the person with the qualifications that most nearly fit those demanded by the job.

Employment methods have been too often merely a kind of hit-or-miss, trial-and-error sort of procedure. Too often employment officers have depended on the looks of the applicant and answers to a few questions asked and a large amount of just plain "hunch." But employment methods

could be more adequate if more careful job analyses were made and more reliable methods of sizing up the individual were used. The usual letter of application tells very little about the individual except that he can write and that he writes a good or a poor letter. (It does not always tell even this, if the applicant gets someone else to write it for him.) And letters of recommendation are often not very reliable or illuminating. Photographs of the applicant tell only what he looks like and not what he can do or what kind of personality or character he possesses. An employment interview is valuable to the extent that the interviewer is trained and experienced in knowing what to look for and how to estimate what he sees and hears. The danger here is that the interviewer may develop some short cuts in which he has faith but which do not furnish a reliable indication of the individual's true personality or ability.

Efficient employment methods require considerable preliminary work. To be able to pick out individuals for a job, it is necessary first to know what the job requires. This calls for a thorough job analysis, which includes an accurate picture of what is actually done on the job and an analysis of these activities in terms of the basic abilities and aptitudes and personality traits involved. When such a job analysis has been made, the next step is to devise ways and means of assessing the applicants, to see whether they possess these abilities, skills, and characteristics. More and more standardized tests are being used to do this; but these tests, to be of value, must be tested by trying them out on the people on the job, to see whether they actually do select the individuals who are the most successful and those that are least successful. Tests not carefully constructed and tested may be misleading and inaccurate.

3. VOCATIONAL ADJUSTMENT

Selecting the right person for the job and the right job for the person is an important part of vocational adjust-

ment, but not the whole story. A survey of any large industrial or commercial establishment will indicate that many workers are discontented and far from happy in their jobs. Wages and hours of work are only two of many causes of discontent, and perhaps not the most important. The highly specialized nature of modern work methods has made it more difficult for the worker to obtain satisfaction of his desire to create. He sometimes cannot see how what he does fits into the larger picture, and he is denied any feeling of achievement. Also, there is a tendency toward monotony, with its unpleasant feelings of boredom and restlessness. Frequently, too, the worker fails to feel any self-importance in his work. He is merely a cog in a complicated machine.

An examination of the wants of the worker indicates how some of the above causes of job dissatisfaction and unrest are being expressed and shows also how it may be possible to counteract their effect.

a. The workers want management to demonstrate an interest in them as persons, not just mechanisms of production.

b. The workers want a chance to discuss with the boss not only their grievances but also the whole work situation, with some assurance that their ideas will receive consideration.

c. The workers want a voice in determining the nature of the policies of the company directly affecting their welfare and status.

d. The workers want to feel that there is complete fairness in all disciplinary action.

e. The workers want a chance to grow on the job, to feel that there is a chance for advancement and that promotion is given for merit.

f. The workers want the conditions of work made suitable for self-respecting human beings, with reasonable hours of work and facilities for their comfort and recreation.

g. The workers want credit for good work and clear instructions as to what is expected of them and constructive suggestions for improvement.

h. The workers want opportunities to contribute to efficient production, a chance to make suggestions and to see the suggestions carried out, or to be shown why these are not feasible.

i. The workers want some assurance of future security, so that there can be some feeling of permanence in the job.

j. The workers want their future assured by pension plans and by unemployment, sickness, and accident insurance.

k. The workers want living conditions that are comfortable—housing, transportation, and educational and recreational facilities.

These wants are universal among workers, and, unless they are met in some way, job satisfaction and a high level of efficiency are impossible. Above all, the worker wants to be thought of and treated as an individual with feelings, ideas, desires, and ambitions. Good morale is possible only when he feels that he is important and accepted in a group which has a purpose that all are cooperating to fulfill.

OUTLINE OF THE CHAPTER

Vocational Adjustment

1. Vocational selection.
 - —the appraisal of the individual—ability.
 - —education and training.
 - —personality.
 - —interests.
 - —health.
 - —job appraisal—education required.
 - —ability required.
 - —special abilities required.
 - —physical requirements.
 - —personality requirements.
 - —interest patterns.
 - —satisfactions offered.
 - —vocational guidance—values.
 - —dangers.
 - —employment methods.

2. Vocational adjustment.
 —wants of workers.

Review Questions

1. What are the values and dangers of vocational guidance?
2. What are the features of the job that should be considered in a job appraisal?
3. What information about the individual is necessary in order to advise him in his choice of a vocation?
4. What are some of the causes of industrial unrest?
5. List features that should be considered in attempts to make workers happy with their work.
6. Expand the statement: "Efficient employment methods require considerable preliminary work."
7. Go over the list of suggested questions for self-analysis given in the text and show how these questions could be used to get information on the five points in self-appraisal.
8. Examine your own work experience and from it list factors that have contributed to your satisfaction with the work situation.
9. List factors in the work situation that you have found lead to dissatisfaction.
10. What general improvements would you suggest for industry in general? Indicate why you think they would be improvements.

Chapter XIV

MENTAL HYGIENE AND SANE LIVING

MENTAL health, like physical health, is a blessed heritage and should be fostered and maintained. During the last hundred years, people have become not only interested but much better informed about the principles of physical health and hygiene. A corresponding development is only just beginning in the field of mental hygiene, although the problem has been just as acute and important.

It has been said that mental illness is increasing. Whether or not this is true is hard to determine. Certainly there are more patients in mental hospitals today than there ever were before; but this is because there is more accommodation for them than previously, and also because there is an increased confidence in mental hospitals. At the present time, there are about as many beds for mental patients as for physical disorders and there could be more. Another reason why mental illness seems to be on the increase is that there are improved facilities and methods for early diagnosis of mental illness and so more cases are discovered than previously.

There are a number of common misapprehensions about mental illness that should be guarded against, because they have retarded progress. Many think of mental illness as a disgrace, to be hidden at all costs; but there is no more reason why mental illness should be considered a disgrace than why measles or an operation for appendicitis should be thought of as disgraceful. Perhaps people have thought of mental illness as a disgrace because they have thought of mental illness being inherited and, therefore, an indication of a family weakness. However, many kinds of mental illness

(and it should be remembered that there *are* many kinds of mental disorder) are not at all the result of heredity but are caused by a maladjustment built up during the lifetime of the individual. Another common idea about mental illness that is not true is that it is sudden in onset—that the person is well and of sound mind one day, and the next day he is crazy. However, it has been shown that most mental illness has a long history of development, taking years to build up to the point where the person is unable to carry on happily and efficiently. Many indications of developing mental illness are evident years before the individual is considered to be ill enough to be sent to a mental hospital. Another common error in thinking about mental illness is the idea that all mentally ill people are dangerous and may do bodily harm to anyone who comes into their path. This is far from being true, as most mentally ill individuals are not at all dangerous. There are a few who are, but these are the exception, not the rule. Nor is mental illness incurable, as many people seem to think. Indeed, a large percentage of the patients in mental hospitals are cured and can return to normal living again.

In this chapter we will not be concerned with the more extreme phases of mental disorder but will consider mainly a program of mental hygiene for the individual—a program designed to help him to build up and maintain a good mental health. Such a program is not merely to prevent mental illness, although that is a part of it, but also to help strengthen and even better the mental health of the normal person.

Good mental health has as its basis or foundation a feeling of security. This feeling is, in turn, based on a true self-confidence that makes the individual feel that he "belongs," that he is "at home" in his world; that he is wanted, has a place, and is important. This feeling of security, of belonging, comes when the individual has learned enough to be able to adjust to most of the everyday situations in which he

finds himself. It is a feeling that banishes apprehension, fear, and strain and enables the person to use his intelligence to deal with his problems and difficulties. In other words, mental health is not the absence of problems and difficulties, but rather an ability to deal with these problems in a satisfying and effective manner. For example, a person can escape from making social blunders if he goes off by himself and never comes in contact with anyone else, but by so doing, even though he rids himself of any problems of social adjustment, he also robs himself of the satisfactions of a normal human life. The mentally healthy individual has learned how to adjust satisfactorily in a world with other people. He has acquired social skills and a knowledge of people that makes him feel at home in a social world and, at the same time, banishes his fears of making social blunders.

The goal of life for most people is the attainment of happiness and contentment; yet happiness seems to be an elusive goal, difficult for most people to attain. About a quarter of the employees of any large mercantile establishment are what might be called *problem cases*. They are repeatedly transferring from one job to another; they are the so-called failures. Almost any classroom of school children has at least one maladjusted child. The very prevalent unrest and dissatisfaction is an indication that a great many people find it difficult to adjust themselves to things as they are. The majority of failures in work and life are due not to any inaptitude or lack of ability but to a faulty attitude toward oneself, toward one's work, or toward other people, or toward life itself. With a careful study of individual cases, most of these individuals can be adjusted; and with the honest acceptance of a few basic principles, most of these failures and maladjustments could be prevented.

We live in a very complicated social structure, a structure that makes many demands on the individual and also imposes many restrictions on his conduct. Mental health consists in making adequate and satisfying adjust-

ments to the many demands of this social environment. The way in which an individual adjusts to life situations is pretty much a matter of habit. He learns to adjust in certain ways and this becomes habitual, so that he meets the constantly changing situations of life in much the same way each time. Because the form of adjustment employed by an individual is a matter of habit, there is some hope, because what has been learned can be modified or unlearned and other habits can be substituted.

We will think, then, of the problem of mental health as a question of acquiring certain habits of adjustment. Here, as in any learning situation, practice makes perfect. It is possible for anyone to acquire certain very necessary habits, such as habitual attitudes toward life and people—habits of optimism, of making decisions promptly, and so on—if he desires to do so and puts enough effort into his attempts.

As we have already seen, the emotions of fear and anger constitute disruptions in the regular adjustment. Fear is caused by a loss of the feeling of security, or by anything that tends to make life and habitual activities uncertain. Anger, on the other hand, results from the thwarting or obstruction of basic motives. The causes of fear and anger run counter, then, to the mental health and happy adjustment of the individual.

Fear results from a conscious inability to do anything in a given situation. The individual worries (and worry is a fear daydream) when he is unable to do anything about the cause of the worry. As we have seen earlier, an emotional state is a condition of preparation for action, the physiological functions being such that strenuous activity is not only possible but required. When fear is present, activity of some kind is desirable. The first suggestion in a program of personal mental hygiene would be, then, to make an attempt to adjust to situations that threaten security, by being active. The antidote for worry is action. If you fear tomorrow and



Courtesy Soil Conservation Service. Photo by Lathrop
If you fear tomorrow, get out in the garden and dig.

what it may bring, don't sit and think about it, but get out into the garden and dig, or attack the woodpile, or at least go for a walk.

Another very valuable personal habit is that of living in the present. Some people have the habit of doing things three times—first in anticipation, dread, and apprehension; then in actual experience; and finally in regretting, repining, and might-have-beening after the event. A certain amount of intelligent planning is, of course, necessary; but, aside from this, bridges should not be crossed before they are reached. The habit of expecting the worst not only puts a heavy strain on the individual but usually influences the happening when it does occur; that is, you expect to fail, not to do well, and this worry may condition your activity in such a way that your expectations will come true. Moreover, mental health requires that the individual shall have acquired the habit of making the best out of a present situation and then, when it is over, accepting as a matter of fact the consequences, whatever they may be, without regret. Worry about the future and regret about the past can only arouse strains and stresses, tensions and emotional upsets, about which nothing can be done. Mental health requires

that you live one day at a time, with no habits of worry and habits of regretting. How can you help worrying? Well, worry is a habit and, like all habits, can be broken by a systematic substitution of another habit in its place.

Mental ill-health comes from fear and apprehension and loss of the feeling of security, but these can be minimized by sharing them with others. Fear when it is brought out into the open and discussed, usually vanishes in thin air; while fear cooped up within the experience of the individual is disturbing and unhealthy. There is considerable help in the realization that we are members of a social group, that everything does not depend on us alone, and that responsibilities can be shared with others.

The searchlight of logic, when it is turned on the fears and worries of everyday life, shows that most fears are useless. A little intelligent reasoning often reveals that we are worrying and fearing without cause. Many times we would find, if we would only stop to examine things, that what we are worrying about is not worth the effort. Most fears are groundless; all fear is useless; and fear seldom fails to be harmful.

There is a very close relationship between physical health and mental health. In fact, careful study shows that much so-called sickness can be directly traced to mental causes. Research has revealed that much indigestion, as well as other stomach and intestinal trouble, is due to worry. Emotional disturbance includes physical disturbance. Digestion stops entirely under the influence of strong emotion. Mental experience affects physical health, and physical health reacts on experience. Sound mental health depends on sound physical health, and physical health in turn depends on mental health. The person who is in good physical health has a much smaller chance of becoming mentally ill. Sufficient sleep, rest, recreation, and exercise in the open air, all contribute to a sound mind in a sound body.

A further source of strain and tensions is the thwarting of our actions. Difficulties, problems, obstacles, or anything

that interferes with the easy fulfillment of our wishes may be the cause of poor mental health. There are at least three ways in which an individual can meet problems and obstacles. He may become angry. He may give up and rationalize with some such query as What's the use? Or he may attack the problem in an intelligent, discovery-seeking attitude. Any one of these methods may become the habitual activity of the individual in the face of difficulty.

Obviously, the third method is the most healthy. Anger is usually destructive of any chance for a useful adjustment to the difficulty. Anger is not socially acceptable, is frowned on by society, and is considered a childish way of meeting difficulties; yet how often do adults fly into a rage when thwarted! Giving up the outward battle and carrying on in imagination only is a fruitless adjustment to obstacles. But the habit of accepting the difficulty as an opportunity to learn something or to make a new adjustment, as a challenge to our abilities, is not only useful but basic to mental health.

Contrast these three individuals with the same ability, the same problem, and draw your own conclusion. One stamps his feet in rage, stalks out of the room, slamming the door, and takes a few days to "cool off" and become ashamed of himself. Another, facing the same problem, says "What's the use?" and goes off to sulk and tell himself how hard life is and how unfair. The third meets the problem with a cheerful attitude and goes to work to solve the difficulty; he accepts it as a challenge to his intelligence and, after persisting for a time, arrives at a happy solution to the difficulty and goes his way looking for new worlds to conquer. The difference between these individuals is a difference in habitual forms of adjustment. Habits can be formed and habits can be broken if the desire and intention are strong enough.

Difficulties come to everyone; obstacles and problems are the common lot of all humanity; but difficulties are

the steppingstones to real progress. As long as life goes on in a routine way, with no problems, no obstacles, no thwarting, there is no advance, no learning, no discovery, and no progress. The realization, then, that frustration of our wishes and normal course of action may be the chance to discover something new, to take a new road, to get out of the rut of ordinary activities, helps us not only to endure such difficulties but even to welcome them.

In the hurry and stress of competitive activities of the twentieth century, most people have lost the habit of living easily. We hurry to get somewhere so that we can hurry back again. The mental health of the individual depends to a large extent on his sense of values. There are many things that we strive for and worry about that are not worth the effort. Even recreation has become work and the source of tensions. If we could only pause long enough to get a glimpse of ourselves, we might be able to laugh at ourselves, and the laugh would do us good. The energy that is wasted on dignity! Mental health requires a sense of values and a sense of humor. Most of the things that make us irritated are not worth the effort at all. Someone steps in front of us to get on the streetcar, and the whole day may be spoiled for ourselves and our associates. The coffee isn't just right at breakfast, and the office staff had better beware what they do, that day! What small, insignificant things we allow to dominate our lives! A sense of values that places these incidents in their proper place, and a sense of humor that enables us to laugh at ourselves make all the difference between irritability, strain, and mental ill-health, and a happy, easy adjustment to life. Live easily. How lightly it is said; but how difficult is the achievement, once we have built up habits of strain and rush. Here, again, however, habits may be broken and other habits substituted if there is strong enough determination.

Cheerfulness is an asset. It is a habit and, like all habits, it can be acquired. Observe any situation where people are thrown together in clubs and meetings, on streetcars, in

stores, and you will be forced to realize how much this is needed. Not only is it valuable for happy social intercourse, but it is needed for personal mental health. In these days, it may be easy to be pessimistic, to be irritated at little or nothing; but such habits are certainly detrimental to mental health. It is not easy to change such habits when they are long established. But here, as in any change of habits, it can be accomplished. Practice makes perfect. It is possible to substitute habits of cheerfulness for habits of pessimistic, grouchy irritability, if we really want to do so.

Another very useful habit is what might be called the *experimental attitude* toward life. "We have been whipping John for five years and he is as bad as ever." "I've tried and tried again and it's always the same; it doesn't work." How often have we heard such statements! When some method of doing things, some way of adjusting, doesn't work, why not try something else? Old ways are always easy ways. New ways and new experiments are always difficult. Perhaps this is the key to the riddle. Perhaps this is the reason we go on in old ways. Happiness depends on success, and success or satisfaction comes more easily when we are open to new methods and new thoughts.

To understand the suggestions given in this chapter is easy, but to put these suggestions into effect is difficult. It involves desire and persistent effort. Mental health does not just happen; it requires practice and care; but the result is worth almost any amount of effort.

In conclusion, we will list a number of principles of mental hygiene, most of which have been discussed above.

OUTLINE OF THE CHAPTER

Suggestions for Personal Mental Hygiene

1. Useful activity should replace worry and fear.
2. Live in the present—one day at a time.
3. Cultivate a variety of interests both in work and in play.

4. Live easily; minimize strains and stresses.
5. Cultivate a sense of perspective—don't let unimportant things disturb you.
6. Acquire the habit of meeting difficulties and problems by an intelligent problem-solving attitude.
7. Learn to make decisions promptly; indecision leads to conflict.
8. Learn to accept the consequences of your decisions and conduct without regret.
9. Cheerfulness and optimism are better than irritability and pessimism.
10. Keep in good condition—a healthy body is conducive to a healthy mind.
11. Be natural—false dignity is not worth the effort.
12. Well-defined aims, purposes, goals, and ideals consciously desired and possible of attainment provide a necessary rudder to the ship of life.
13. Learn to live with others and learn to be interested in others; avoid being a lone wolf.
14. Adopt the experimental attitude, avoiding the well-worn ruts.
15. Keep in touch with reality; learn to accept things as they are.

Review Questions

1. List misconceptions about mental illness.
2. What does the term *security* mean?
3. Select what you consider to be the most pertinent suggestion for yourself and show how you could apply this suggestion to your own activity.
4. "Difficulties are the steppingstones to real progress." Explain this statement.
5. There are 15 rules given in the outline of the chapter. Take each one of these rules and indicate how it could be applied to advantage in everyday life.

Part V

KNOWING OUR WORLD

This final section of our study explores the technical details of the process of "coming to know." It describes the avenues of knowledge—the sense organs; the process of observation, including attending and perceiving; the process of learning; and also thinking and imagination.

Some of the questions to be answered are:

What are the sense organs and how do they function?
What are the characteristics of attention?
What are the stimuli that attract and direct attention?
What are the kinds of attention and how do they develop?
What is distraction and how can it be handled?
What are the fundamentals of perceiving?
What are the common errors in perceiving?
What are the important features of learning?
How is learning measured?
What are the factors affecting the efficiency of learning?
How can habits be broken?
What are the fundamentals of thinking?
What is a good reasoner like?
What is the place of imagination in human life?
How can thinking be improved?

Chapter XV

THE SENSES AND SENSATIONS—THE AVENUES OF KNOWLEDGE

I. THE SENSE ORGANS AND THEIR FUNCTIONS

All knowledge comes through the sense organs. The individual finds out facts or discovers information by observing with the sense organs and by thinking, or by both together. As we shall see later, all the material of thought comes through the sense-organ avenues, so that the basis of all knowledge is the functioning of these organs.

In the most primitive animal, the one-celled amoeba, there are no sense organs, but the whole animal is sensitive. The same cell carries on the functions of receiving stimulation and acting on it. However, in animals with more than one cell there is a specialization of structure for particular purposes. In the highest form of animal life, the mammals, the process of specialization is very extensive, and special organs have been developed for the purpose of receiving stimuli, conducting impulses, reacting, digesting, breathing, and so on.

Each sense organ is like a delicate receiving and registering instrument, an indicator of some particular force or energy. The eye, for instance, is so constructed that it is capable of receiving and registering light waves, just as a radio receiving set is made to receive and register waves in the ether. Each sense organ is highly sensitive to a particular form of energy. The sense organ for hearing is sensitive, for instance, to sound waves but not to light waves. The sense cells themselves are not visible from the outside but lie within the depth of the organ. Each sense organ is composed of the sensory cells, a sensory nerve connecting these cells with

the central nervous system, and accessory apparatus to aid in the efficient reception of sense impressions. The sensory cells are connected by individual nerve fibers with the central nervous system, and thus indirectly with every other part of the body. It is through these connections that the stimulation affecting a sense organ has an influence on the behavior of the individual.

The characteristics of a sense organ may be summarized as follows: (*a*) It is selective; that is, it responds to a certain kind of stimulus and not to all kinds of stimuli. (*b*) It is sensitive, so that it is capable of responding to even faint stimuli. (*c*) It is graduated, so that it can respond differently to different intensities of the stimulus. (*d*) It has the power of differentiating between different qualities of the stimulus.

There are many more sense organs than the traditional five. These organs are the only avenues through which information regarding the external world, as well as the condition of the organism itself, can enter the experience of the individual. All knowledge originates from experience, and all experience is dependent upon sensory impressions.

Because the functions of the sense organs is the reception of stimuli, this system is generally called the *receptor* system. A very useful classification of the receptors consists of three divisions, namely, the *exteroceptors*, or receptors receiving stimulation from the exterior of the body; the *proprioceptors*, receiving stimulation from gross movements of the body; and *interoceptors*, receiving stimulation from the visceral parts or internal organs of the body. The following list indicates the main systems of sense organs according to this classification:

Classification of receptors.

I. The exteroceptors.
 1. Distance receptors (stimulation from a distance).
 a. Organ of vision—the eye.
 b. Organ of audition—the ear.
 c. Organ of smell—in the nose.

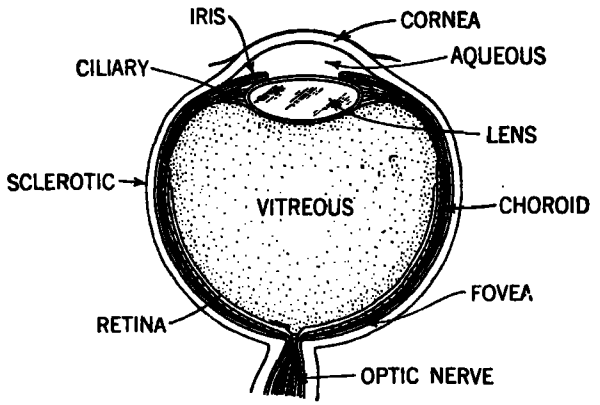
2. Contact receptors (stimulation through contact).
 a. Organs of touch and pressure.
 b. Organs of warmth.
 c. Organs of cold.
 d. Organs of pain.

II. The proprioceptors.
 1. Organs of position and equilibrium—in the internal ear.
 2. Organs of kinesthetic functions.
 a. Organs in the muscles.
 b. Organs in the tendons.
 c. Organs in the joints.

III. The interoceptors.
 1. Receptors in the digestive system.
 a. Organs of smell.
 b. Organs of taste.
 c. Organs of hunger.
 d. Organs of thirst.
 e. Organs of nausea.
 2. Receptors in the circulatory system.
 3. Receptors in the respiratory system.
 4. Receptors in the reproductive system.

2. VISUAL SENSITIVITY

The most important sense organ in the life of the human being is that for vision. This sense organ consists of the millions of sensory cells in the eye and an elaborate accessory apparatus to make the reception of the light waves more efficient. The light waves enter the eye through the *cornea*,



The human eye is the most important of our sense organs. Its apparatus for receiving light waves and carrying them to the brain—shown in this cross-section view—is a highly efficient one.

which is a transparent front surface of the eyeball. They pass through the small opening in the iris, called the *pupil.* The iris muscle controls the size of the pupil, which opens or closes depending on the intensity of the light that strikes the eye. Behind the pupil the light passes through the lens, the function of which is to bring the light rays to a focus on the sensitive surface of the retina. Changes in the shape of the lens, brought about by the ciliary muscle, regulate the focus for objects of varying distance from the eye. After the light passes through the lens it continues on through a transparent substance in the large cavity of the eye and finally reaches the retina, which is the inner layer of the eyeball and is composed of the actual sensory cells for vision. There are millions of these little cells, some of which are called *rods* and are stimulated by grays, while others, called *cones,* mediate color sensations. Each one of these sensory. cells is connected by a nerve fiber with the optic nerve, which runs back to end in the brain. The point directly behind the pupil is called the *fovea;* this is the point of clearest vision, containing cones in great abundance. The point where the optic nerve leaves the eyeball is blind, as there are no rods and cones at that point.

The effective stimulus for vision is provided, as has been stated, by light waves of a certain frequency range. The eye is sensitive to the intermediate range of wave lengths in the light waves. Differences in the wave length of the light stimulus produce differences in the hue of the resulting sensation. Brightness is related to the energy of the light, and saturation to the purity of the light waves.

Visual sensations may be classified into two series: a brightness series and a color series. The brightness series varies from white to black. Every visual sensation can be said to have a certain brightness value; that is, it can be placed somewhere in the brightness series. The color-tone series can be arranged roughly in a circle, with the four primary colors—red, yellow, blue, and green—spaced around

this circle. Starting at red on the color circle and working toward yellow, we can fill in the spaces with the different orange shades, which are combinations of red and yellow. Continuing on beyond the yellow on the circle, we have greenish yellow and yellowish green to pure green, then bluish green and greenish blue to pure blue. Past the blue we come to the violet hues running into purples; finally, as the purples become more red, we complete the circle and have returned to the red again. A third series may be formed with each hue. This is the saturation series, ranging from a fully saturated red, for instance, to a very faint pink, all members of the series having the same hue and brightness. The three ways, therefore, in which a visual sensation may vary are in brightness, in hue or color tone, and in saturation; and every visual sensation may be described in terms of these three variables.

Some indication of the functioning of the visual sensations may be obtained from a review of a number of simple experiments.

a. Color mixing.

Every light wave in the visible range produces some specific color hue. There are about 160 distinguishable color tones. Every hue except the four primary colors can be produced by mixing light waves on a color wheel. If we place on the color wheel a red and a yellow disk and rotate the wheel rapidly, the resulting sensation is orange, which is a blend. If we mix blue with yellow, the resulting sensation is gray; and these colors are called *complementary hues*. The colors opposite each other on our color circle are complementary to each other; that is, they produce a gray sensation when mixed in this way. All other mixtures produce color blends.

b. Aftersensations.

If you look intently at an intense stimulus, such as a light bulb, and then close the eyes, the sensation persists.

This is called a *positive afterimage*, or *aftersensation*. If, again, you were to stare at a square red card for about half a minute, then remove the card and look at a gray background, a square of green would appear, this being a negative afterimage, green being the complementary color to the original red.

c. Adaptation.

When one enters a dark room from the bright sunlight, at first nothing is seen, but after a time the objects in the room become visible. The eyes have become dark adapted. If now the reverse process occurs, leaving the dark room for the bright out-of-doors, at first the light is dazzling, but after a time the eyes become light adapted and vision becomes clear again. If you were to put on a pair of red-colored glasses, at first everything would seem to be a vivid red; but, if the glasses are worn for a period of time, the vivid red fades out and everything appears natural again. Suddenly remove the red glasses, and everything will have a greenish tinge.

d. Color blindness.

About 4 per cent of all men and about ¼ of 1 per cent of all women are color blind to a certain extent. Color blindness is not a disease but an inherited defect in the color apparatus of the eye. It is not at present curable. Total color blindness is very rare and amounts to brightness vision only. Partial color blindness, or red-green blindness, accounts for nearly all color-blind individuals, who have yellow and blue color sensations, as well as the brightness series, but no red or green. Often such a person is not aware of his defect. He has difficulty at times in selecting neckties or other colored items of wearing apparel, in obeying the red and green traffic lights, in picking strawberries, and in other situations where red and green may be confused by one who is unable to distinguish them. There are a number of very

good color-blindness tests, which are valuable in selecting candidates for positions that require an ability accurately to distinguish red and green; for example, locomotive engineers or dress designers. Some of these tests make use of colored yarns; others, of cards with cleverly arranged figures in different hues; and still others, of colored lights.

Out of a number of theories of vision that have been suggested, we will mention briefly only one. Hering's theory assumes that there are three specialized structures, or mechanisms, in the eye. These three substances are the black-white substance, the red-green substance, and the blue-yellow substance. When the eye is stimulated with blue, for instance, there is a chemical change in the yellow-blue substance that gives rise to a sensation of blue. When the blue stimulus is removed, the blue-yellow substance tends to return to normal and this causes a negative after-sensation of yellow. The red-green color-blind individual lacks the red-green substance in his visual apparatus. This theory explains very well the facts of color mixing, after-sensations, and color blindness.

One of the most important functions of the eye is to distinguish spatial forms and patterns. The eye sees only when it is not in motion. For example, when a person is reading, his eyes take a series of jumps and pauses along the line of print, and it is during the pauses only that the visual impression is made. When one is looking at a scene the same thing is taking place, the eyes are jumping from one feature of the scene to another and visual sensations result while the eye is at rest. The eye moves so fast and there is so slight a lag in the sensations that we are not conscious of any blurring or period of no impression. This fact of the lag of visual sensations is utilized in the motion picture, where one picture follows another so quickly that the eye has not time to recover during the interval. The succeeding pictures are slightly different, so that the illusion of motion is produced.

The two eyes work together. Binocular vision has certain advantages over monocular vision. There is, first, the factor of reinforcement; that is, the binocular sensation is slightly more intense than a monocular sensation. In near vision, more is seen of the object with two eyes than with one, the right eye seeing farther around to the right and the left eye farther to the left, so that the solid object is seen more completely with two eyes than the one only. The most important value of binocular vision is in the perception of depth, or the third dimension. The two eyes receive slightly different pictures, and the combination or fusion of these two slightly different pictures produces the illusion of depth. This principle of slightly dissimilar impressions is utilized in the stereoscope.

3. AUDITORY SENSITIVITY

The sense organs for hearing are situated in the cochlea of the inner ear. Vibrations in the air, which constitute the effective stimuli for audition, are collected by the outer ear and transmitted through the auditory canal to the tympanic membrane or eardrum. When this membrane is set in motion, the vibrations are carried by a set of three tiny bones to another membrane in the cochlea, which, in turn, sets in motion the liquid in the inner ear; finally, this vibration affects the hair cells, which are the sensory cells for hearing. These little hair cells are tuned to different rates of vibration and constitute the mechanism that differentiates the different sounds.

The stimulus for audition is a restricted range of wave lengths in the air—from about 18 vibrations per second to about 50,000 per second. These vibrations vary in several ways—in wave length, in the amplitude of the wave, and in the complexity of the vibrating wave. Each of them is related to a particular quality of the resulting sensation.

Auditory sensations may be roughly classified into tones and noises, tones being relatively smooth while noises are

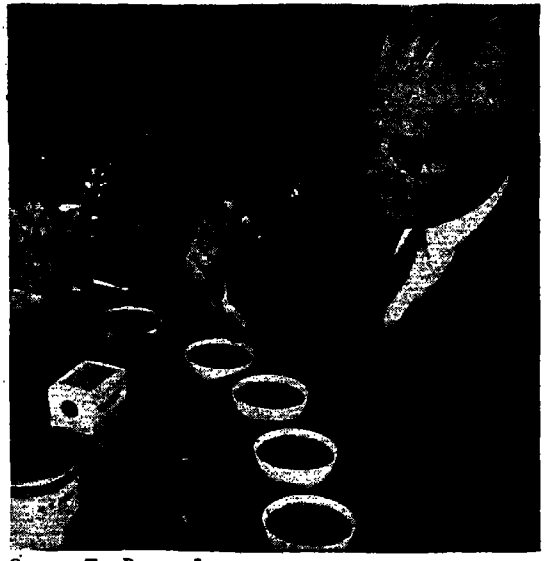
irregular. These sensations differ in pitch, depending on the wave length of the stimulus; in loudness, depending on the amplitude of the wave; and in timbre, depending on the complexity of the wave motion. Timbre is the characteristic sound of the different sources of sound that enables us to tell whether the sound originates from a human voice, a piano, or some other instrument, even when the pitch and loudness of the various sounds are the same.

4. OLFACTORY SENSITIVITY

The sense organ for smell is located in the upper nasal cavity. The actual sense organs are small hairlike cells connected, of course, with sensory nerves. The stimulus for smell consists of particles in the air carried by air currents into the nose. The salient olfactory sensations have been determined as follows: fruity, flowery, spicy, resinous, smoky, and putrid. One very prominent characteristic of the olfactory modality is the factor of sensory adaptation. When the sense cells for smell have been assailed by any particular odor for a period of time, they become adapted and that particular odor is no longer perceived. Olfactory sensations are closely bound up with taste sensations and a large part of what is usually called taste is really the action of this sense modality. Outside the function of smell in the taste of foods, olfactory sensations play only a very slight part in the life of human beings, although this is one of the most important sense modalities in lower animals.

5. GUSTATORY SENSITIVITY

The sense organs for taste are located on the upper surface of the tongue and in certain regions in the back of the throat. The sense organs are the taste buds, which are situated in little grooves in these regions. The stimulus for taste is substances in solution. In order that any object may be tasted, it must be in solution so that it may penetrate into these little grooves and thus affect the taste buds. There



Courtesy Tea Bureau, Inc.

All taste sensations are of four elementary kinds—sour, sweet, salt, and bitter—or combinations of these four elements. Which one or ones do you think this U.S. Tea Examiner experiences when he samples different kinds of tea?

are four elementary taste sensations, which have been analyzed from the complex tastes. They are sour, sweet, salt, and bitter. All tastes are combinations of these elements. The four elementary sensations have different distributions over the surface of the tongue.

The sensations that are usually called *taste* sensations are really combinations of taste sensations and sensations from other sense modalities. If the olfactory sensations are excluded, the taste of a potato and an onion are almost identical. In the taste of most food, odor is more important than actual taste sensations. Cutaneous sensations, heat and cold, and the hardness and softness of foods all contribute to the combined "taste" of foods.

6. CUTANEOUS SENSITIVITY

There are many kinds of sensation received from the skin. By means of the sense organs in the skin we are able to discriminate between rough and smooth, hot and cold, itching and tickling, pricking and stinging, moist and dry, as well as to sense touch, shape, hardness and softness, and many other varieties of skin sensitivity. Careful experiments have demonstrated that all skin sensitivity can be analyzed into

four kinds of elementary sensation qualities—touch, warm, cold, and pain. All other sensations are blends of these.

These four elementary sensations may be distinguished by means of a little experiment. Map out a small area of the skin and explore this area with a fine instrument. It will be found that there are certain fairly well-defined spots that give a definite sensation of touch, while other places on the skin do not. Do the same with a cold instrument and again with a hot instrument. If the different spots are charted, it will be found that the touch spots differ from the warm spots, which again differ from the cold spots. These four kinds of skin sensations have sense organs that are separate and distinct.

7. STATIC SENSITIVITY

The sense organ for equilibrium is in the semicircular canals of the inner ear. These sense organs are stimulated by movements of the head. They are essential in the maintenance of bodily equilibrium in all movements of the body. When these sensations become too intense, they constitute dizziness.

8. KINESTHETIC SENSITIVITY

In each muscle, tendon, and joint, there are sense organs that are aroused by movements of the muscles, tendons, or joints. The resulting sensations are called *kinesthetic* sensations, or sensations of movement. This sense modality is extremely important in any activity involving the movements of the limbs, and without it the complex coordinations involved in walking, writing, manipulation, and so on, would be impossible. Kinesthetic sensations are necessary in judgments of distance and depth by the eye, in the intricate muscular movements required for speech, and, in fact, in any activity that involves accuracy of muscular movement.

9. ORGANIC SENSITIVITY

Sense organs running into the millions are to be found in the inner linings of the body. We know very little about these, as yet; but we do know that they serve the very important function of making us aware of the condition of the various internal organs of the body. Sensations of hunger, thirst, faintness, nausea, and suffocation are a few of the varieties of the organic sensations. Pains of various kinds also originate from these sense organs. Such organic sensations, sometimes very vague and indefinite, contribute in great part to the feeling tone, the mood, and even the train of thought of the individual. These organic sensations are indicators of bodily condition and are thus directors of action. They are at the basis of the appetites, which were discussed in an earlier chapter.

10. SENSATIONS AND ACTIVITY

The individual becomes acquainted with the world in which he lives through the sense-organ avenues; but sensations serve a larger purpose than merely to give the individual information about the world. Sensations initiate activity and also direct activity after it is started. They are stimuli to action. They are conditions requiring some form of adjustment on the part of the individual. The precision of muscular movement is possible only by the guidance of the eye, the muscle sense, and the sense of equilibrium. In the next chapter we will trace the sensations in their influence on activity. Sensations are meaningless in themselves; but, when they acquire meaning in perception, they become the basis of the adjustment of the individual to an objective world.

Sensations have their place in the experience of the individual aside from their function as the origin of knowledge. They are utilized in the aesthetic appreciation of art

and music. The life of feeling and emotion is also based on sensations. We might go so far as to say that sensations are the groundwork of all experience and activity.

OUTLINE OF THE CHAPTER

The Senses and Sensations

1. Characteristics of the sense organs.
 —selective.
 —sensitive.
 —graduated.
 —differentiating.
2. Sensory modalities.
 a. Visual.
 —sense organ—rods and cones of retina.
 —stimulus—light waves of an intermediate range.
 —sensations—brightness—black to white.
 —color—primary—red, yellow, blue, green.
 b. Auditory.
 —sense organ—sensory cells in cochlea of inner ear.
 —stimulus—sound waves of restricted range.
 —sensations—tones and noises.
 c. Olfactory.
 —sense organ—sensory cells in upper nasal cavity.
 —stimulus—particles carried in the air.
 —sensations—fruity, flowery, spicy, resinous, smoky, putrid.
 d. Gustatory.
 —sense organ—cells in taste buds of tongue.
 —stimulus—substances in solution.
 —sensations—sour, sweet, salt, bitter.
 e. Cutaneous.
 —sense organ—sensory cells in skin.
 —stimulus—objects in contact with skin.
 —sensations—touch, warm, cold, pain.
 f. Static.
 —sense organ—sensory cells in semicircular canals of the inner ear.
 —stimulus—head movement.
 —sensations—head position and movement.

g. Kinesthetic.
—sense organ—sensory cells in muscles, tendons, and joints.
—stimulus—movement of parts of the body.
—sensations—movement, strain, etc.

h. Organic.
—sense organ—sensory cells in inner linings and viscera.
—stimulus—bodily functions and conditions.
—sensations—bodily condition (hunger, etc.)

Review Questions

1. What are the characteristics of a sense organ?
2. Comment on the statement: "All knowledge comes through the sense organs."
3. Trace a visual stimulus from its source to its arrival at the retina of the eye.
4. Try to produce a negative afterimage and describe how it was obtained.
5. List situations and occupations where color blindness would be a handicap.
6. What is meant by sensory adaptation? Give examples.
7. What sensations other than taste are usually involved in what is commonly called the taste of food?
8. What is the relationship of sensations and activity?
9. Relate pitch, loudness, and timbre to the physical characteristics of the sound stimulus.
10. Expand the statement: "The two eyes work together."

Chapter XVI

OBSERVATION—ATTENTION AND PERCEPTION

1. INTRODUCTORY STATEMENT

BEFORE any sensory experience becomes knowledge there are several other stages needed besides mere sensory impression. Knowing usually involves an act of attending. Attention may be defined as a preliminary act of adjustment on the part of the individual that is conducive to a more effective knowledge of the object. Objects and events, when attended to, become clearer and more distinct in the consciousness of the individual. Attention to an object renders that object a more effective stimulus to action. The next stage is that of perceiving. When an individual attends to a sensory stimulation, he recalls from previous experience information bearing on the present situation, and thus ascribes meaning to the stimulation and perceives the stimulus as an object or event with meaning or significance for action.

Another feature of knowing is remembering, which is the process of reviving past experiences in such a way that they have significance in the present situation. In any act of knowing, the past experience of the individual plays a part by giving the present sensory impression a significance in terms of previous experiences with like stimulation.

Thinking is another process in knowing. Thinking is the manipulation of experiences into new patterns and forms. Imagining is one kind of mental manipulation in which experiences are combined into novel configurations. Reasoning is another form of thinking, in which an inference is the final result of the mental manipulation. Conceiving is the process of divorcing experiences from particular

situations and is, thus, thinking in general terms or in terms of principles.

All these stages or types of knowing are bound up together, so that any one act of knowing may include all or most of them. For purposes of discussion, we have separated these stages and processes; but it should be kept in mind that in actual life these stages are not separate and distinct by any means.

In order to make these rather vague remarks more concrete, let us look at an example of the functioning of the various stages and processes in knowing. Suppose that we take as our example robbery. It is fairly obvious what we mean by attending to and perceiving a robbery. In that case, we are actually present as the robbery takes place. We concentrate our attention on the event as it takes place. The sensory impressions become perceptions as we give meaning to them by means of past knowledge. Sensory impressions become perceptions of a man with a mask and a revolver telling the bank clerks to hold up their hands and then scooping up the money. This combination of sensory impressions, plus the interpretation that we are able to put on them because of past experience, leads us to say "It's a holdup."

To remember a robbery implies that sometime in the past we actually perceived a robbery, and now we recall it as an event that took place at a particular time and in a particular place. The accuracy of the memory depends on the accuracy of the original perception, plus the retention of the experience and the ability to recall it. Thinking about a robbery may take a number of forms. We may reason it out as follows: We come home from our summer vacation and find that the cellar window is broken, that the furniture is not as we left it, and that the silver and jewelry are missing. From these pieces of information we infer that a robbery has taken place, even though we did not perceive it or remember it.

We might imagine a robbery by putting together experiences and forming a new pattern. The materials of our imagination we get from past experience, but the final result is something that has never occurred. To form a conception of a robbery, we think of robbery not in any particular place or at any particular time; nor do we think of any particular kind of robbery, but merely of robbery in general, or activity defined as taking things that do not belong to one.

2. THE CHARACTERISTICS OF THE ATTENDING RESPONSE

Attending to an object implies a number of things. It means, first, a motor response that brings the stimulation from the object into as clear a focus as possible. The attentive attitude is characteristically that of tense immobility. All restless, random movements cease, and the whole body is oriented toward the source of the stimulation.

An audience that is attending to a speaker is not restless; in fact, nothing is heard but the words of the speaker; all eyes are directed toward the platform, and the members of the audience are literally sitting on the edge of their seats. An inattentive audience, on the other hand, is characterized by restless movements. Some are gazing out the windows, others are fiddling with objects, while others are leaning back in their seats in an attitude of relaxation. Besides this motor attitude of tenseness, there are also sense organ adjustments in attention. If it is visual attention, the eyes are focused and directed; if it is tactual attention, the object is manipulated so that the maximum of tactual sensation may be received.

What we attend to controls our behavior, and what we get other people to attend to controls their behavior. The whole process of obtaining knowledge or information depends on attention. Our memory of any experience is conditioned directly by the degree of attention that is given. The person who is unable to remember the names

of others whom he meets is one who does not attend closely to a name as he hears it. The training of memory can be achieved almost entirely in terms of practice in attention. What we attend to determines what we react to. Attention implies the reception of stimuli that will direct our activity. It is equally true that the direction of the activity of other people can be achieved through the direction of their attention. Advertising and display have been recognized as one means of directing the buying of a nation. Attitudes, opinions, and beliefs are formed when we can get people to attend to what we wish. Half the battle in selling life insurance is won when the salesman gets his prospect to attend to the pertinent features of the situation. We control the education of our children by arranging what they will attend to. We fail sometimes in this endeavor because we fail to take into account all the things that attract the attention of the children. The maladjusted boy who appears in juvenile court is there because he has attended to the wrong things, and often because we have failed to fill his attention with enough worth-while things.

3. KINDS OF STIMULI THAT ATTRACT ATTENTION

It is impossible to attend to everything. Attention is by its very nature a selective process. What determines the direction of attention? Of the many factors contributing to the direction of attention, we shall be able to mention only the more prominent.

For purposes of discussion, we may divide the stimuli for attention into two classes—the objective and the subjective factors. By "objective factors" we mean those features of objects and events that attract attention, irrespective of volition and learning. By "subjective factors" is meant those features that are dependent on the condition of the individual himself.

The objective factors determining the direction of attention are those features of the environmental stimuli that

seem to have the power of attracting the attention of both the child and the adult, irrespective of any learning or even desire on the part of the individual. (*a*) Changing stimuli tend to attract and hold the attention. Any main street in a city or town offers an example of this feature—the ever-changing electric-light signs command attention with their continual change. We sit in a room reading and suddenly our attention is called to the fact that the clock has stopped. It had been ticking along without attracting our attention, but the stopping of the regular ticking sound is adequate to attract our attention. (*b*) Intense stimulation demands attention. An intense or bright light, a loud sound, a strong odor capture and hold the attention much more surely than dim lights, low sounds, or indistinct odors. (*c*) Constant repetition of the same stimulus eventually attracts the attention. (*d*) The unusual or the novel is another objective feature that is powerful in directing the attention. (*e*) Objects definite in form and outline are more likely to attract the attention than are objects that are indistinct and indefinite. (*f*) Objects that are related to basic needs or appetites are usually attended to. Objects pertaining to basic sensory needs, such as hunger, thirst, heat, cold, and relief from pain, have powerful factors on their side in the competition for the attention of the individual.

The tremendous dominance of immediate sensory experience over attention was, of course, of value to primitive man in his continual struggle for existence in a world of ever-present dangers. Even for the highly civilized man of modern times these objective features of stimulation, change, intensity, novelty, etc., are powerful in directing attention and thus, indirectly, his activity. The immediate sensory situation is the characteristic concern of the young child; but even the sophisticated adult is also dominated to a large extent by the same features.

Man is characteristically a learning animal. His activity is being continually modified in the light of experience.

This is true of attention as well as of any other feature of activity. In general, anything that seems worth while to the individual attracts his attention; and he learns what to consider worth while. So, with learning, the kinds of stimuli that attract attention are increased, even though the primitive type of attention mentioned in the former section is never left behind. These features depending on learning and experience we have called the *subjective* factors in the direction of attention.

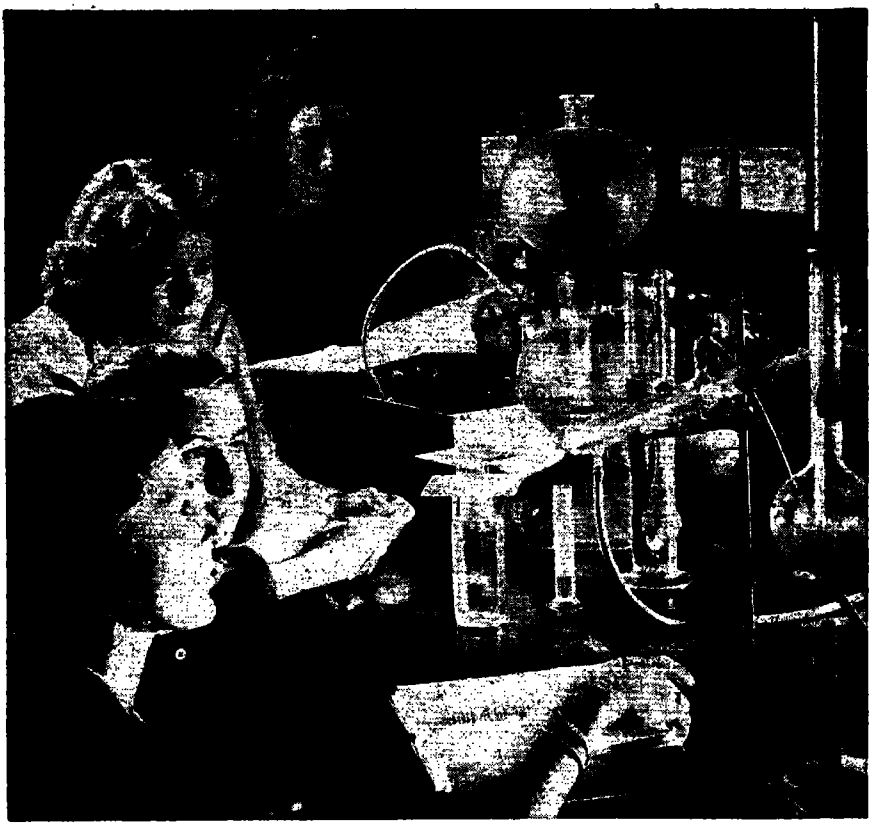
(*a*) What the individual is doing at the time conditions what he will pay attention to. Stimuli that have a bearing on this activity in progress direct attention toward themselves. (*b*) Present desire also dictates the direction of attention. The individual who desires a new car attends to the cars as they pass. The woman who feels the need of a new hat looks in all the millinery-store windows as she walks down the street. (*c*) Interest is another powerful dictator in the realm of attention. It is a well-known fact that different people see different things in the same scene. A farmer, an artist, a real estate man, and a botanist standing on a hill together and looking out over the land actually perceive different things, because they attend to different aspects of the situation, depending on their interests. (*d*) The emotion or mood of the moment also directs the attention. The pessimist sees nothing but ruin, while the optimist sees a glorious future. The young man in love attends only to the good features of his ladylove, while the young lady's rival attends to rather different features in the same person. (*e*) Fashion is a powerful director of attention. What "everybody" is doing or saying demands attention and commands action. Social suggestion is a powerful stimulus to attention and action. (*f*) Imagined situations direct the attention to anything that is related. Imagine that you would like to be a well-educated person or a beautiful one or the possessor of an attractive personality, and your attention will be directed to the advertisements that seem to make these

imagined experiences possible. (*g*) You can build up habits of attention to certain kinds of objects and inattention to others. These habits are built up because of some of the factors already mentioned—interest, fashion, necessity—but, once established, they are very powerful in directing the attention.

To revert to what we said at the beginning of this section, attention directs action. To educate oneself, it is necessary to develop interest and desires that will, in turn, direct one's attention and thus produce the first essential of knowledge. To influence other people in any line of action requires making use of stimuli that are effective in capturing their attention. If a person is interested, he is attentive. If interest is not present, then the next best thing is to manipulate the stimuli so as to capture the attention through the objective factors mentioned above.

4. IMPORTANT FEATURES OF ATTENDING

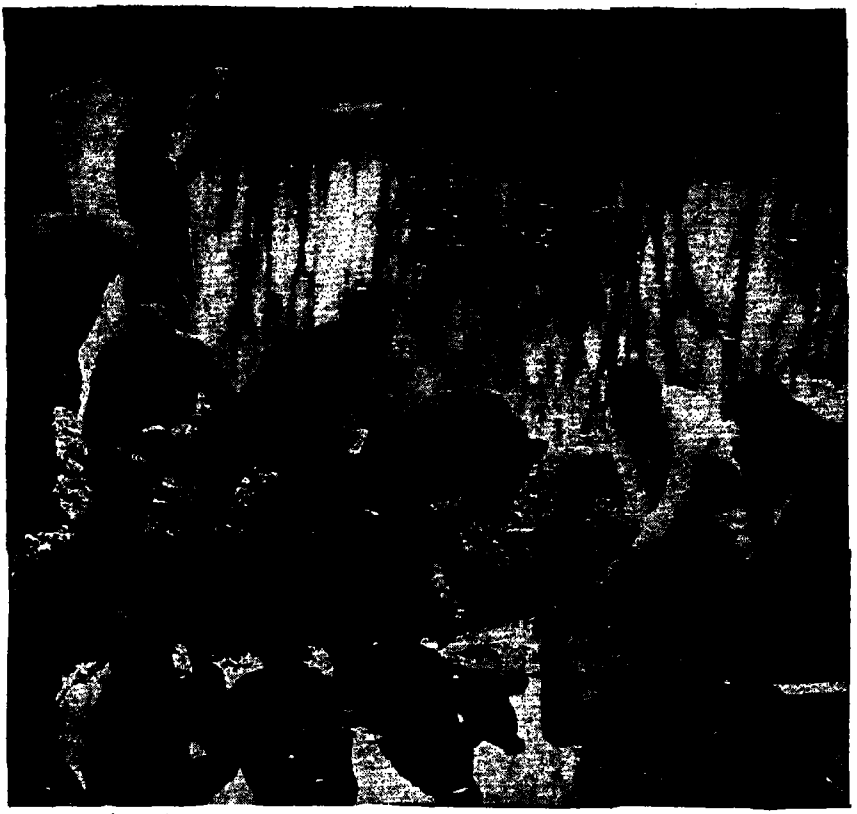
Attention is a shifting process. It is impossible to attend to one simple stimulus for any length of time. Most objects are complex, and the mobile, shifting nature of attention results in one feature being attended to for a short time and then the attention shifting to other features. Attention can be given to only one thing at a time. Most of the examples of attending to a number of things at once can be explained on the basis of the shifting of the attention from one thing to another rapidly. There is a limit to the span or duration of attention. Young children are unable to attend to any one thing for any length of time, but with age the span of attention increases. This increase is due to training or the formation of habits of attention. There is also a limit to the number of stimuli that can be apprehended in one act of attention. The fundamental nature of the attending response is exploration. Because attention is mobile, we are able to explore the environment and discover those things that are of significance for the activity of the moment.



Courtesy Northampton School for Girls, Northampton, Mass.
Spontaneous attention is given when there is real interest and stimulus.→

5. KINDS OF ATTENTION AND HOW THEY DEVELOP

We may distinguish three kinds of attention and trace their development in the life of the individual. The first kind we will call *random* attention. This is characteristically attention without effort and is involuntary. This is the most primitive form of attention. It is determined by the stimulus itself, and the features of the stimuli that are responsible for it were mentioned above as the objective factors that attract and hold the attention. It is unlearned and is the characteristic attention of the young child. This kind of attention is not sustained for any length of time, because as soon as any new stimulus occurs the attention shifts. There is no goal or



Courtesy Blair Academy, Blairstown, N. J.

. . . . It is the most fruitful of the three kinds of attention.

purpose present and no real interest in the object that attracts the attention.

The second kind of attention and the second stage in the development of sustained attention is the forced, *voluntary* attention that is given with conscious effort; it is usually imposed on the individual by some extraneous motive, such as reward or punishment. This is the kind of attention that is predominantly unpleasant, forced, and unnatural. It is the characteristic attention of the school child whose interest in schoolwork has not been aroused, but who attends to the task at hand because of the switch at the back of the teacher. It is costly in terms of effort, because, desire and interest being absent, the individual has to force himself to attend.

It is productive of strains and stresses, because there are usually conflicting tendencies present in the individual. The child is forcing himself to attend to something because of fear or because of the desire to win approval; but his desires and inclinations are elsewhere. When the worker is not happy in his work and forces himself to attend to his task, the attention comes with effort and sometimes at the cost of his mental and physical health. It is very doubtful whether the so-called discipline of forcing oneself to do the undesirable is worth the effort. An old theory of education and child training suggests that it is necessary to force children to do uninteresting and undesirable tasks because it is good for them to thus discipline themselves. This old theory has to give place to newer knowledge, which goes deeper and shows that it is much more efficient to create an interest in the activity itself than to force the individual to take part in an activity in the hope that a habit of doing it will be formed. This leads us to the third kind of attention, or the third stage in the development of attention.

The most economical and efficient kind of attention is the spontaneous attention that follows real interest in the thing itself. This kind of attention is effortless, or at least there is not the feeling of strain or effort that characterized the former type. The individual is interested in the activity, so there is no costly effort and no conflict with desires. It is a fruitful kind of attention. It is the kind that the school child gives to his work when he is really interested in it and is not doing it merely because of fear of punishment or social disapproval. We will call this attention *spontaneous*, and we find that the directing influences are goals and purposes. This is the characteristic attention of the well-adjusted worker.

6. INATTENTION

As long as the individual is conscious, he is always attending to something, so that inattention is really attending to the wrong things. When we say that the child is inattentive at

school, we mean that he is attending to something that is outside the school routine. He may be attending to his own thoughts of a game of baseball that he is to play, or of the swimming pool where he wishes he might be; or he may be attending to the clouds passing by the school window. The absent-minded individual is inattentive because he is very attentive to something else. About all that can be said of inattention is that it is attention directed toward something other than the task or the matter at hand.

Sustained attention is the attention given to an object or task for a considerable length of time. It is usually the result of an interest in the event or the task itself. It is a simple matter to arrange conditions so that an individual's attention will be captured by some feature of the situation; but, because of the shifting nature of attention, it is more difficult to keep that attention directed for any length of time.

The attention that is given with effort, because of fear or mere politeness, is usually unpleasant; but attention that is given because of real interest in the subject itself is not only pleasant but also fruitful. This is the secret of capturing and holding the attention of others. If the individual's interest is aroused, his attention can be sustained.

7. DISTRACTION

A distraction may be defined as any stimulus that does not fit in with the line of the thought or purpose of the moment. A stimulus, to be a distraction to sustained attention, must have features in itself that are strong enough to redirect the attention of the individual. Random attention is easily distracted, and so is voluntary attention; but spontaneous attention is much more difficult to distract.

Distractions can be overcome in a number of ways. One very common way of overcoming distraction is to put more energy into the task itself. Mistakes and lack of efficiency

in any task may be due to inability to do better, but they are usually caused by distractions. More energy may be poured into an activity by the stimulation of more interest in the task itself. If this is impossible, the next best thing is to increase the motivation by artificial means, such as rewards or bonuses. Workers who have been working along at one level of efficiency for years have been known to increase their output materially when a bonus was offered for increased speed. The effect of distractions and of overcoming distractions may be illustrated by an experiment that was tried with typists. The efficiency of these typists was measured in terms of the amount of output both with and without controlled distractions. It was found that in most cases the typewriting under distraction was even faster than that without the distractions. When the amount of effort put into the task was measured by recording the amount of pressure on the keys, it was found that the keys were struck much more heavily under conditions of distraction than at other times. This indicates that distractions may be overcome by increased effort. The more effort is put into most tasks, the more permanent is the impression made; so that, in learning situations, distractions may even serve to promote efficiency. However, this may be rather costly in terms of fatigue.

Another method of overcoming the effect of distractions is to build up habits of inattention to the distracting stimuli. When an individual moves into a house on a streetcar line, at first the noise of the streetcars is very noticeable and distracting, but in time the individual learns to disregard the noise altogether, and the distraction loses its effectiveness. This is the process of negative adaptation.

8. THE NATURE OF PERCEIVING

Perceiving may be defined as coming to know a present object in relation to some act of adjustment. Human activity is a succession of adjustments. A process of perceiving is involved in most acts of adjustment. Perceiving includes a

stimulating situation, a preliminary attentive adjustment toward it, and the arousal of the meaning or significance of the stimulus in reference to what is being done or some contemplated mode of reaction. Chapter XV outlined the kinds of stimulation, and the preceding section treated the attentive response, so all that remains to discuss is the arousal of meaning.

Any sensory situation may become an object of perception. The term *perceiving* is closely related in most people's thought with seeing; but objects may be perceived through any sense or through various combinations of senses. Listening to a conversation, smelling a meal in preparation, tasting food, testing the temperature of the bath, as well as looking at a picture or reading a book, are perceptual activities. The identification of some food in the mouth through the combined use of taste, smell, contact, and temperature is an act of perception, also. Sight, hearing, and tactual sensations may combine in other perceptual activities. Perception is not limited to objects of the external world; for we may perceive our own movements, a feeling of hunger, or a toothache. Kinesthesis and organic sensations, as well as sight and hearing, may form the basis of perceptions; and so, in fact, may any sense modality.

A perceptual object usually involves an organized group of sense data. This organized group of sense data is usually sensed through a number of sense modalities. Perceiving a play in a football game often involves not only visual sensations but also hearing and kinesthetic sensations, as one sways in sympathy with the ball carrier. The perceptual significance of motion pictures was greatly enhanced when sound was added to the sight of the pictures on the screen.

The organized character of the sense data is a product of previous experience. A foreign language is a mere jumble of sounds when first heard; but, as these sounds become associated with the individual's experience, as he learns the language, the character of the sounds becomes altered in the

experience of the learner until they are heard not as a jumble of sounds, but in an organized fashion, as sounds with a meaning. When we have learned to read, we have acquired the habit of perceiving the marks on a printed page as being organized into units of words and sentences having meaning. The object may remain constant, but it is perceived in different ways, depending on the previous experience of the individual. A young child may perceive an object as a ball, something to manipulate and to play with, while an adult will perceive the same object as an orange, something to eat.

The diverse perceptions of the same objective fact are due to the observer's attitude toward it and also to his previous experience. The process of perceiving is fundamentally the process of ascribing meaning to the sensory data to which we attend. The meaning given to sensory experience depends on the past experience of the observer. We add to what we see or hear or taste our own interpretation of the sensory experience. This interpretation depends directly on our experience with like sensory data in the past. The perception depends, to a great extent, on the language response. When we are asked what we see in any particular situation, our response is in terms of the names of the objects that we have learned.

When we observe a picture, we do not see the picture as it is but we actually perceive more than is there; for our perception of the picture has three dimensions, the third dimension of depth being added through the acquired habit of seeing depth when certain features of perspective are present. This perception of depth in a two-dimensional picture is an illusion. Most perceptual activities have a certain amount of illusion in them. In other words, we add more to the sensory data than is actually there. This is a characteristic of perception. We see an orange-colored sphere, but we perceive an orange, an article of food; and we even anticipate the taste of the orange as our mouth waters.

The ordinary individual is accustomed to perceiving

things not as they are but as they ought to be, or at least as he thinks they ought to be or as he has been accustomed to seeing them. Mistakes in spelling and other typographical errors may escape even the careful reader, because in reading he does not actually see every word and letter but only the general configuration of the words, and he fills in the meaning from only a small part of the actual print. It is possible to read a line accurately when only a fraction of each letter is present. We perceive an object as a table, although we are able to see only two of the four legs and a portion of the top.

Each object acquires in the course of the individual's experience a multitude of associations and, thus, a variety of potential meanings. Objects do not possess meaning in themselves but are endowed with meaning by the individual who perceives them, and the amount and character of the meaning that an object attains is a function of the individual's past experience. The significance of objects is then a matter of growth and development. The meanings given to objects by children are different from the meanings given to the same objects by mature individuals.

We may now summarize some of the main features of the perceptual activity that we have discussed. (1) Any sensory situation may be an object of perception. (2) The perception is determined by the character of the previous experience of the individual. (3) Information, in addition to the sensory data, is added in perceiving. Our discussion of perceiving is still not complete, for there are further features that determine the nature of the perception.

Although every object may have many possible meanings, the significance given to the object in perception is dependent on the varying circumstances in which it is perceived. The significance of a wild animal in a cage is very different from that given to the same animal in the open. The perception is, therefore, dependent on the character of the objective environment in which it is perceived. Because the environ-

ment in which objects are perceived varies greatly from time to time, the meaning of the objects varies as well.

Another feature determining the character of the perception is the condition of the individual who is perceiving. The meaning of a beefsteak varies with the condition of the digestive tract of the observer. The meaning of an object varies with the purpose of the moment. A person hanging a picture may perceive a clothesbrush as an object with which to pound in a tack, while the same individual would perceive the same object at another time as an instrument with which to brush his coat. Finally, an object will have varying meanings, depending on the sensory aspect of the object noticed. Every object is more or less complex from a sensory point of view, and it is possible to attend to a number of different features of the object. Just what particular feature is attended to determines what the character of the perception will be.

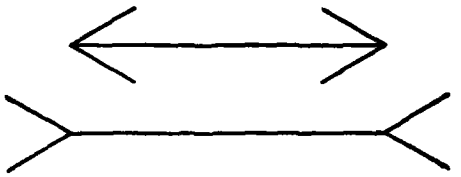
9. COMMON ERRORS IN PERCEPTION

As we have seen, perception is the process of ascribing meaning or significance to sense data. We have noted, also, that the meaning given is dependent on a number of things, such as the objective environment, the previous experience of the individual, the condition of the organism, the purpose and activity of the moment, as well as the particular feature of the sensory object to which attention is given. It is possible, therefore, that the same object may be perceived in different ways by different individuals and by the same individual at different times. Most perceptions are inaccurate, or at least incomplete. A survey of the kinds and conditions of illusions or errors of perception may aid in an understanding of the basic process.

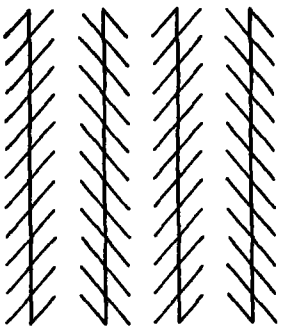
Although nearly every perception has some amount of error, it is not usually called an *illusion* unless the error is large or striking. While inaccuracies and inadequacies are prevalent in the whole field of perception, we are not

usually aware of them, and in most cases they have no serious consequences, although there are occasions when the accuracy of a perception is very important.

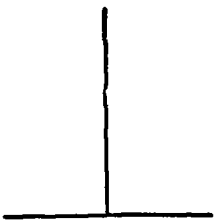
Errors in perception, or illusions, may be due to a number of factors, among which might be mentioned (*a*) irregular or unusual conditions in the external world; (*b*) defects,



Which line looks longer ?
Measure them !



Are the vertical lines parallel ?
Test them !

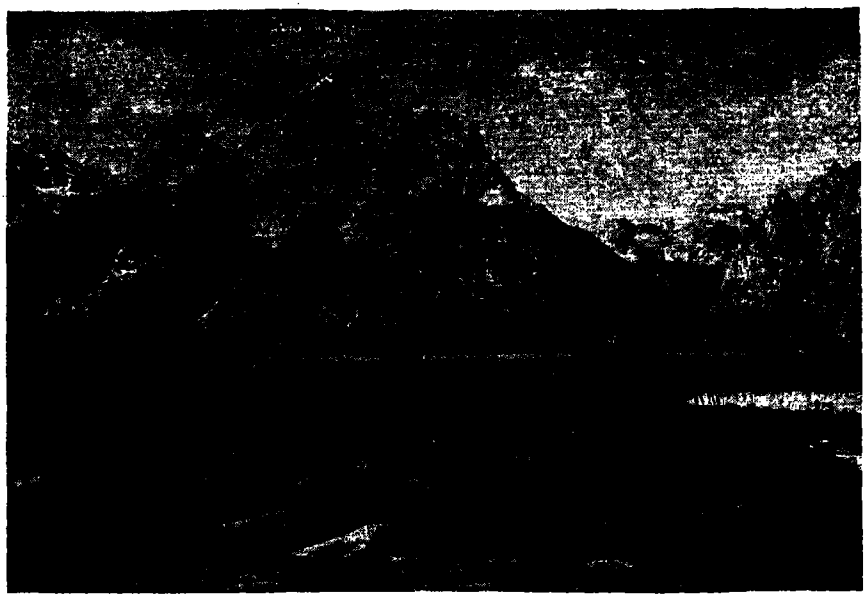


Which line looks longer ?
Measure them !

Visual illusion is only one of many common errors in perception. We may say, however, that most perception is inaccurate or incomplete.

inadequacies, or peculiarities in the sense organs; (*c*) established habits, previous experience, present interests or attitudes, and expectation or suggestion.

A pencil in a glass of water appears to be bent, although it is actually perfectly straight. This is due to the refraction of the light waves by the water. This perception of a bent stick is a false perception, or an illusion, and is caused by a peculiarity of the objective stimulus. Seeing one's face in a mirror is also an illusion; but this is an illusion that is allowed



Courtesy National Park Service, U. S. Department of the Interior
That mountains appear closer than they really are is an illusion due to atmospheric conditions.

for, as we have learned that it is not a true face but a reflection of the image of our own features. Mountains are sometimes perceived as being not very far distant, whereas they are actually about a hundred miles away. This is again an illusion—one that is due to the atmospheric conditions.

Our sense organs are very useful instruments, but they are not infallible or always accurate by any means. If a sound is made directly behind a person whose eyes are blindfolded, he may perceive the sound as directly in front of himself, because the perception of the location of sound without the aid of vision is extremely inaccurate. The visual after-sensations, already mentioned, are examples of illusions caused by peculiarities of the sense organs. Two points about a half inch apart are readily perceived as two when applied to the hand, but when they are applied to the middle of the back they are perceived as one. If the right hand is left in a bowl of hot water and the left hand in a bowl of cold water for some time, and then both hands are thrust

into a bowl of lukewarm water, that water seems cold to one hand and warm to the other. These few simple examples will serve to indicate that perceptions are conditioned by limitations in the functioning of the sense organs.

Innumerable errors of perception are caused by the direction of the attention to some particular part of the total situation and the neglecting of other features. The stage illusions of the magician are mostly in this class. He cleverly directs the attention of his audience to some part of what he is doing and away from other things. The common illusion of motion that nearly everyone has experienced in a standing train may be taken as another example. If your car is motionless, while another on the next track starts in the opposite direction, you may erroneously perceive that your train is moving. The movement of the field of vision in the opposite direction is only a part of the adequate stimuli for the perception of motion and, in this example, the person is making use of only one feature of the situation in his perception.

Anticipation, or expectation, is another powerful influence in the production of errors of perception. After one has been reading a rather thrilling mystery story, the shriek of the wind may easily be perceived as a cry of distress or a white garment draped over a chair may be perceived as a ghost. Experiments on suggestion have shown that college students can easily be led to feel electric shocks when none exist, to report warmth in an unheated box, to taste different things in distilled water, to smell odorless liquids, to feel pressure on the hand when none is applied, to find differences in the length of lines or in the weight of objects when no such differences exist. Medical students have been known to have all the symptoms of a disorder after studying these symptoms in their textbooks.

Habits of expectation may work in different ways. If a piece of cork and a piece of lead weighing exactly the same, but painted to look alike, are given to a child, he will im-

mediately tell you that the cork is the heavier because it is the larger.

If these same objects are given to an adult to test, he will tell you that the smaller is the heavier because, he, like the child, expected the larger to be the heavier and thus when he lifted them he put more effort into lifting the larger, and the extra effort made the cork seem lighter than the lead. Other examples of the influence of suggestion were given in Chap. VI.

Perception is far from being accurate. Illusions or misinterpretations of sense impressions are very common. There are certain checks that may be applied to perceptions to determine their accuracy. The data from one sense modality may be verified in some cases by sensations from other sensory avenues. There is also what might be called an *experimental* check, in which the stimuli are varied in different ways to determine the effect on the perception. Another check is social. Do other people perceive it in the same way as we do? Even with all these checks, however, it is impossible always to be sure whether a perception is free from illusion. I saw it with my own eyes or heard it with my own ears cannot always be accepted as a criterion of accuracy.

Social perception may be even more inaccurate and incomplete than the perception of objects. The accurate perception of the attitudes, feelings, and emotions of others is very important in social interaction. The individual who is successful in social situations is the individual who has learned to perceive accurately the signs of feeling and emotion in others. The person who fails to perceive that he is being very boring usually fails to make a satisfactory impression on others. Social perception is similar to any other perception. There is a body of sensory data, the attention is given to these data, and the significance of the sensory data is inferred. The ability to perceive in the expression and actions of others how they feel about things, what mood

they are in, and so on, grows with experience; in other words, it is acquired or learned. The young child is usually lacking in this ability, but it increases as his experience with other people is widened.

One method of studying social perception is by means of photographs. A set of photographs depicting various emotions is prepared. These photographs are given to a number of individuals and they decide what emotion is portrayed. The ability to perceive correctly the emotion portrayed increases gradually with age. The average adult is fairly accurate, but not by any means perfect. Society seems to have demanded that individuals hide their emotions as much as possible, so that in actual life the emotional expression may not be so distinct or exaggerated as in these prepared pictures. Thus the accuracy of perception of emotion is further reduced.

Estimates of traits of character and personality are also notoriously inaccurate. It would be very valuable if psychology could succeed in analyzing and classifying the signs by means of which intelligence, honesty, and other characteristics are perceived, and thus reduce such perception to a science. So far, this has been impossible. Some people believe that they can perceive accurately the ability and other personality characteristics of individuals by means of such features as the shape of the face; but such systems have not been of any real value, as they usually fail when put to actual test.

Hollingworth, in a very interesting experiment, studied the ability of 12 expert employment or sales managers to judge human traits and to determine the fitness of 57 candidates for a particular kind of work. Each of the managers saw the men for 2 hours, as they were being put through a series of tests. Later, the managers observed each candidate as he stood up before an audience and announced his name and other facts about himself. Each of the managers then interviewed each candidate separately and asked whatever

questions he desired. Each manager ranked the candidates in order of merit; and, when the rankings of the various judges were compared, it was found that any candidate might be ranked anywhere from near the best to near the worst by the different judges. There was no real correspondence of judgment by the various managers. This example is typical of many other experiments, which have shown that the perception of ability and personality in others is usually extremely inaccurate.

It was found that, when photographs of children ranging all the way from feeble-minded to very bright were given to a number of individuals to rank in order of intelligence, the judgments were not any better than they would have been if the judges had ranked them by looking at the backs of the photographs. Other examples of character analysis have been given in Chap. XI.

10. THE PLACE OF PERCEPTION IN ADJUSTMENT

We have seen that perception is the process of ascribing meaning or significance to sense data that are attended to. We have seen also that the meaning or significance given to any sense data is determined by a number of conditions, and that perceptions are often inaccurate. Now a word about the function of perception in adjustment must be added.

Human activity is a series of adjustments to environmental conditions. Each day and each minute brings its own problems. A problem is a situation in which the individual finds himself, for which he has no ready-made activity that is adequate to take care of it. To adjust to certain situations is easy, because we have learned what to do under such conditions. Learning implies that the individual has at some time or other modified his activity in such a way that he is able to adjust to this situation. This learning process is going on continually as long as the individual lives. Learning implies that there is a problem requiring some adjustment. Perception forms a link in the chain. For example, the individ-

ual finds himself in a novel situation and is forced to make some adjustment. The form that the adjustment will take is determined largely by the meaning or significance given to the situation in the individual's perception of it. Perception is not an isolated process but is involved in all activity as well as in the acquisition of knowledge or information.

OUTLINE OF THE CHAPTER

Observation—Attention and Perception

I—Attention—Characteristics—motor response.
—immobility.
—sense-organ adjustments.
—Stimuli—objective—change.
—intensity.
—repetition.
—novelty.
—definite form.
—basic needs.
—subjective—present occupation.
—present desire.
—interest.
—mood.
—fashion or custom.
—imagined situations.
—habits.
—Features—shifting.
—attention span.
—Kinds—random.
—voluntary.
—spontaneous.
—Inattention—misdirected attention.
—*Distraction*—*stimuli competing against directed* attention.
—overcome by—more energy.
—habits of inattention.

II—Perception.
—The nature of perceiving.
—Errors in perception.
—Perception and activity.

Review Questions

1. How would you try to capture the attention of an individual and how would you sustain his attention?
2. Make a list of factors of advantage in attention.
3. What are some of the factors that determine the meaning or significance of a perception?
4. List the causes of errors in perception.
5. Describe three kinds of attention and show how they develop.
6. How can distractions be overcome?
7. What are the fundamental features of the process of perceiving?
8. Why is social perception liable to be in error?
9. What is the function of perception in adjustment?
10. What is usually meant by inattention?

Chapter XVII

LEARNING

I. LEARNING DEFINED

LEARNING may be defined as the more or less permanent modification of an individual's activity in a given situation, due to practice in attempts to achieve some goal or solve some problem. The several features of this definition should become clearer as we proceed with the discussion. The activity of the individual is changed or modified in two ways: by maturation, or growth, and by learning.

From the beginning of the individual's life he is continually undergoing development or change. Besides the process of natural growth, or maturation, there is also the process of modification due to experience. While maturation is pretty much a process of development with which the individual himself has little to do, learning is very much an active process and depends on the activity of the individual himself.

Living is adjusting; and adjusting is a process of modifying one's activity to fit the varying circumstances of life. Learning is perhaps the most important topic in psychology.

The complex behavior of the adult is the result of the gradual but continual modification of the activity of the individual from birth till death. The primitive responses of the infant soon become inadequate to meet the complex situations of human relationships and activities and have to be modified. As we have seen, the child has a number of needs or appetites that demand a satisfactory adjustment, and so the child has to learn to satisfy these appetites in a way that is not only adequate but also socially acceptable.

2. LEARNING IN PHYLOGENETIC AND ONTOGENETIC DEVELOPMENT

One indication of the importance of the process of learning is to trace the place of learning throughout the animal scale and also in the development of the human individual. All animals can and do learn, but not all animals learn an equal amount or equally fast. In the animal kingdom there is a progressive increase in the amount and complexity of learning with an increase in the complexity of the nervous system. Learning is the basis of the process of adapting to the changing conditions of life.

The human being has the greatest power of adaptability and, therefore, the greatest learning ability. As we have noted before, the human infant comes into the world with very few adequate forms of behavior but with an enormous capacity for learning or modifying this behavior to adapt to the varied conditions of living. During the first few years of the life of the infant he learns many useful things, he acquires muscular coordinations of various kinds, he learns to manipulate objects and also people, he is acquiring the meanings of objects and events. During the preschool years the child learns to walk, to talk, to control physiological habits, to eat, to dress, to fear certain things, and so on through an almost endless list of activities.

With the beginning of school life, the child is started on the long trail of acquiring information that has been accumulated by his forebears through long centuries, or at least that part of this information that a wise school system decrees is necessary. Along with this formal learning there goes a wide variety of other learnings, social behavior, the ethics of the street and the school yard, the control of emotions, nonacademic skills involved in play and athletics, and the likes and dislikes that are related to all these activities. As the child increases in age, the field of his learning increases in scope, and he begins the acquisition of the skills

that are to be useful later in earning a living. Even when the child has developed into an adult, the learning does not stop, for he is continually acquiring new information, learning new activities, forming new opinions, beliefs, and ideas. So learning goes on from birth till death, and to stop learning is to stop living. We cannot help learning, but we can control what we learn and how we learn. This extremely incomplete picture of development will perhaps serve to emphasize the importance of the process of learning. Many associate the term *learning* with the formal education process, but learning means much more than schooling.

Another way of indicating the importance of this topic of learning and, at the same time, showing how all the topics of psychology are bound up together, is to glance briefly through the topics already discussed and see what part learning plays in them all. In our discussion of attention we noted a development of the different kinds of attention—involuntary, voluntary, and spontaneous. This development took place through learning. Perception, we found, was the process of acquiring meanings for sensory impressions. Thinking and imagination involve learning. Feelings, likes and dislikes, attitudes are all acquired. Emotions of fear and anger are modified during development by learning. Motivation showed a progressive change in the kinds of effective motives due to learning. So, throughout all the topics discussed, there has been a background of learning. Now we are to study this learning process in detail.

3. KINDS OF LEARNING

There are a number of different kinds of learning, which, of course, may be expressions of one basic process. Activities may be organized into new patterns of behavior; for example, in learning to typewrite, the activities of sitting upright, of manipulating the fingers, and so on, are organized into a new pattern of activity, that of striking the keys in a systematic way in order to achieve a desired result. Activities

may be isolated from larger behavior units and used for definite purposes aside from the larger behavior pattern to which they originally belonged. Activities may be selected from a wide range of varied behavior. This kind of learning is often called *trial-and-error*-learning.

The detachment of a response from a stimulus, usually called *negative adaptation*, is another kind of learning, in which we learn not to respond to a constantly recurring but harmless and perhaps meaningless stimulus. Again, a response may be attached to a stimulus with which it originally had no connection. This method of learning is usually called the *conditioned-response* method. It may be illustrated by one of the famous experiments of the Russian physiologist Pavlov, in which the response—flow of saliva—was connected through repetition with a new stimulus, the ringing of a bell. Another form of learning is seen in memorizing, where the stimulus for the activity is gradually reduced until finally the individual is able to repeat a poem, for instance, without the stimulus of the printed page, merely requiring the title of the poem to start and sustain the activity. These are some of the main kinds of learning. They are probably all similar in some fundamental respects, and may be considered as varieties of the one process of learning.

4. VERBAL LEARNING, OR MEMORIZATION

Remembering is the direct use of what has been learned; it is performing a ready-made activity that was acquired in the past. There are a number of features concerned with the process of remembering that require attention. First, there is the process of memorizing, then there are two ways of indicating that the individual remembers—by recall and recognition; and finally there is the fact of retention. We will deal with these various features in turn. Memory, or remembering, is one of the parts of psychology in which experiments have been very fruitful in indicating what

conditions are favorable or unfavorable in producing efficiency of performance.

Memorizing is the process of experiencing or coming to know something in such a way as to be able to recall it at a later time, or at least to recognize that it has been experienced before. Memorizing can be illustrated best in terms of verbal material. Insight into the fundamental process may be acquired if we analyze the process into its simple features. The first feature to be considered is the immediate memory span. A short series of words or syllables or digits can be reproduced accurately without error after the series has once been seen or heard. However, if the series is much longer, this is impossible. By means of a simple experiment the length of a series that can be immediately reproduced after one impression can be determined. This is what is called the *immediate memory span.* Take the following series of letters, and, covering them with a piece of paper, slide the paper along until you can see just the first line; read it once; try to reproduce it without looking at the book; then test your reproduction. Go on to the next line and so on through the list.

vrs
tmxb
cfylp
qwdgbk
tfszbkv
ufkrpsjr
yguowpxvq
pytkdvwlna
clyntpwqklx
lghdpwcnbtyo

When you have tried this experiment you will know that there is a limit to the amount of material that can be retained after one reading. When more material than the immediate memory span is attempted, it is found that the individual is unable to reproduce even so much as the memory

span. In the example above, if you discovered that your immediate memory span was seven letters, when you attempted a longer series you were unable to reproduce seven, but were probably able to reproduce only three or four. This inability or inhibition is present whenever the individual attempts to remember more than the immediate memory span. However, it is possible, by repetition to memorize even very long material. Repetition is the method utilized to overcome the inhibition that occurs when the material is too long to grasp in one impression. The function of repetition is to enable the individual to increase the meaningfulness of the material, or to relate the different parts of the material together.

This process of overcoming the inhibition requires further study. Another simple experiment may illustrate a fundamental feature of the process of memorization. Starting with list 1, read the list, then test to see how much you can recall, either by writing or by having someone check your recall with the book. Continue in this way until you are able to recall the total list without error. Go on to list 2 and follow the same procedure; then do the same with lists 3 and 4. Keep count each time of the number of repetitions of the list that were necessary in order to learn it.

List I	*List* II	*List* III	*List* IV
dat	tree	apple	man
muv	skate	grapes	can
bak	street	peach	improve
cin	happy	pear	his
kog	concrete	plum	condition
gam	yesterday	cherry	greatly
lop	violet	raspberry	by
ris	chocolate	pineapple	constant
fid	picture	orange	steady
cek	candle	quince	work

The main difference between these series of words is in meaningfullness. List 1 is almost meaningless; list 2 gives words that are real words with a real meaning, but there is

no obvious connection between them; while list 3 contains words that are all names of fruits, and list 4 forms a sentence with meaning. Your results in memorizing the above lists probably have showed that the more meaning there is in the material the more easily and quickly is that material learned. The function of repetition in memorization is to *discover meaning in the material or, if no meaning exists,* to manufacture some. The process of memorization is, therefore, an active process; and the more observant the learner is in seeking and discovering meaning and relationships within the material being learned, the more efficient he is in the task.

The perception of any object or event is not a guarantee that it will be remembered. Most people look at their watches dozens of times every day; yet, if you ask a large number of people to tell you whether the numerals on their watches are Roman or Arabic, most of them will be unable to do so. They have made no effort to learn or memorize that piece of information and, consequently, there has been no retention. This is another fundamental fact about remembering: it is not a passive sponging up of information but an active seeking, discovering process, in which the intention to remember is present.

Retention is not an activity but rather a resting state. Memorization produces some effects, presumably on the nervous system, so that, when at a later date the individual is called upon to make use of the material memorized, he recalls it. What goes on in between memorization and recall is not known. However, a few facts may give us a little idea as to what retention is.

The effects produced by memorization seem gradually to fade away, if the original experience is not recalled or used. The secret of permanent retention of any material is frequent use of that material. The curve of forgetting, or the graphical representation of the amount of information retained in the memory for various lengths of time, indicates

that usually a great deal is forgotten immediately after learning and then the forgetting slows down. Material that is overlearned is forgotten more slowly than material which is barely learned. Meaningful material is also retained better than is meaningless material.

Retention may be aided by constant review or use. Materials may be remembered for long periods if they are reviewed from time to time. The reverse is true for those experiences that we wish to forget. They can be forgotten by avoiding all reference to them, by avoiding all scenes and circumstances that are likely to suggest them. Some people try to suppress unpleasant experiences, but the process of suppression, as we have seen in another connection, is a rather dangerous procedure.

The characteristics of recall and recognition may be studied best by a survey of the difficulties in these functions. Recall is the process of reviving an experience, while recognition is the process of knowing that you have had the experience before. One reason why we are unable to recall material or experiences is that we have failed in the actual learning or memorization. Even when material has been well learned, there are some occasions when it cannot be recalled. We know a person's name, for instance, but we are unable to recall it. We may know the answer to an examination question, but at the actual examination we give the wrong answer, and only later on the way home we recall what we should have written. There has been some kind of interference blocking the recall.

One very common type of interference is emotional experience. Stage fright has marred many a well-prepared speech. Fear, anger, or self-consciousness will often form a barrier to efficient recall. This kind of interference can be removed if the person will become so interested and absorbed in his subject as to forget himself. Self-consciousness is caused by the individual's attending to himself and worrying about what other people are thinking. If the individual can attend

to the actual material he is recalling and not to himself, this fear or self-consciousness is not present to block recall.

Another kind of interference occurs when one recall blocks another. You try to recall a person's name, but another name is aroused and this name blocks the recall of the name that is wanted. In solving a difficult problem, such as a problem in mathematics, an incorrect solution keeps recurring, thus preventing the recall of any other solution. A course that is usually effective in such a situation is to drop the activity entirely for a time and come back to it later.

Further light is obtained on the process of recall when retention is imperfect and there is only partial recall. In such situations, the interesting thing is that the individual usually fills in the blanks and makes a rounded-out picture. In the recall of imperfectly learned drawings, the reproductions from memory resemble the originals in some particulars but in every case the reproduction is complete in itself. The same is true of partially recalled names—only a part of the name is correctly recalled but the rest is filled in with other syllables. In the recall of events and experiences, this same process can be noted. Certain facts are remembered, other facts are forgotten; but the recall of the experience is filled out to make a complete, logical account, so that when it is checked against what actually did happen there are many inaccuracies and errors. Most recall is imperfect in some respect. Some facts are eliminated, others are emphasized, and the whole is made into a rounded-out, complete account.

There is always a stimulus for recall. This stimulus is not so complete as it was in the original experience. You memorized "The Charge of the Light Brigade," and now the title of the poem may be a sufficient stimulus to start you to reciting the poem. The stimulus in the learning situation was the printed poem. The process of remembering is, then, the performance now with a reduced stimulus of some activity that was originally performed with a much more complete stimulating situation. The essential feature in

memorization is the reduction of the stimulus necessary to call forth a complex response, and recall is the arousing of an activity by means of a reduced stimulus.

Recognition is easier than recall. If you were to read over a list of 50 names, you would probably be able to recall only a few of the list; but if, after reading over the 50 names, you were to read another list among which were the first 50 names, you would probably be able to recognize or pick out of that list a number of the original list. It may be very difficult to sit down and write out a list of the persons who were your classmates at school; but, if you read a list of alumni of the old school, you would probably be able to recognize most of the names of your classmates in the larger list.

Just as is the case in recall, so recognition is not by any means always perfect. There are errors in the process of recognition. Almost everyone has at some time or other spoken to someone whom he thought that he knew, only to discover that the other was a total stranger. Recognition makes use of reduced stimuli, just as recall does. In the case of wrong identification, there were some features of the stranger that were similar to those of the friend, and the reaction to a part of the total situation caused the false recognition.

In order to make sure of later recognition of an object or a person, it is best to make some definite response to the object or individual. To be able to recognize an object at a later date, it is necessary to have noted something about it, such as how it differs from other objects. Casual observation of faces is not usually enough to ensure their later recognition. Experiments with students have shown that recognition is often very imperfect, unless there is an actual attention to the individual and a conscious noting of features that distinguish one individual from another.

5. AN ANALYSIS OF THE PROCESS OF LEARNING

Thus far in our account of learning, we have succeeded in making the topic very complicated, so it is time to introduce

some simplification. Often much is learned about a mechanism or a process by taking it apart, so we will try to take apart this process of learning and look at the separate features of it. In order to do this, let us look at a very simple example of learning. Suppose that a very intelligent dog has been locked in the woodshed without food for 24 hours. There is a large yard enclosed by a high fence, and in one corner of the yard there is a gate with a thumb latch. When the hungry dog is let out into the yard, a plate of very desirable food is placed outside the gate within sight and smell of the dog. He goes through a wide variety of behavior, running around the yard, trying to jump over the fence, digging under the fence, barking and whining. He spends most of his time in the corner of the yard where the gate is.

Finally, after about an hour, in one of his jumps at the gate, the dog's paw comes in contact with the thumb latch, the gate opens, and the dog gets the food. Has he learned to let himself out of the yard? If so, how did he learn? These questions can be answered only by further trials. Again the dog is locked up away from food, and again he is let out into the yard. He has not learned, after all; for he goes through much the same procedure as before, running, jumping, barking, scratching. However, eventually he does get out again. Can the dog ever learn to let himself out of the yard immediately after he is put in? This can be found out by continuing the tests. After being tested day after day, finally, in a few weeks, the dog learns to go immediately to the gate, paw the latch, and thus open the gate.

Let us retrace our steps and find out what we can learn from this dog experiment. One very important thing that we took for granted we must have learned from previous experience with dogs. This is that it is necessary to have the dog hungry if we expect him to try to get out to reach the food. This fact we will call the first point in our analysis—*the necessity for motivation*. This point cannot be stressed too much. There must be a reason for all activity. The learner

must have some form of motivation. No motivation, no learning!

Let us look for some other features of this process. We were careful in the dog experiment to arrange things so that he could not get at the food immediately, and yet in such a way that he could reach it after a time. In other words, we arranged a problem for a dog. If there had been no problem, there would have been nothing for the dog to learn, no necessity for learning. If we had padlocked the gate and put the key in the yard for the dog to find and use to unlock the gate, either the dog would have starved to death or the experiment would have been called off. To put this in other words, before there is learning, there has to be a problem; and the problem must be a possible one for the learner. Besides, the learner must recognize that there is a problem. So, the second important feature of the learning process we have found is the presence of a problem that is possible of solution and that is recognized by the learner.

In order to have learning, the problem must be more than recognized; it must be attacked. The dog attacked his problem vigorously. He tried every kind of behavior that he had found to be of use in other situations. His attack on the problem was diverse, with recourse to many different efforts. If he had tried only one kind of activity, such as running around the yard looking for holes in the fence, he would have died of exhaustion without succeeding. The more varied and extensive the past experience of the individual, the more likely is he to try out different lines of attack. The more intelligent the individual is, the less is the attack overt and the more does it conform to reasoning and not to trial-and-error behavior.

A human subject in such a problematic situation would probably sit down and figure out the situation in some such terms as these: "Let's see, if I tried that way, it wouldn't work; and if I tried this, it probably wouldn't work either; but here, let's see how this would work. No, that wouldn't

work either." So he would go on until he discovered in his reasoning a way out, and then he would proceed directly and immediately to the solution. However, whether the attack is overt or in thought, there must be an active attack on the problem before a solution is discovered and learning takes place. This is the third feature in the learning process.

Another important feature of learning is illustrated in the dog experiment. The dog was persistent until he achieved success. Persistence is the fourth essential to learning. Persistence is a function that consists of a number of elements. For instance, the past history of successes and failures conditions the persistence in learning situations. If the individual has been unsuccessful in most situations, he expects failure and thus does not persist for any length of time. When the individual has learned to expect success because he has been successful in most situations, he will persist until he has found a solution. Success produces confidence and confidence in oneself is productive of persistence. The child accustomed to failure soon gives up. Persistence is a function of the motivation. If the result is worth the effort, the individual persists until he is successful.

We also found that in the case of the dog repetition was necessary for learning. What happens during repetition is that the correct solution is selected from the variety of possible activities, and is fixated. The useless or nonadequate forms of activity drop out as they are proved useless. In human learning there are times when the learner discovers and fixates the solution in one attempt and repetition seems unnecessary, but such occasions are very infrequent. Even on those occasions when the solution is discovered quickly, it is usually necessary to repeat the whole situation and the activity in order to fixate it, so that it will be remembered later.

If we look at any other examples of learning, such as that of a white rat learning to run a maze, an ape learning a complicated problem, a child learning to talk, a bride learning





Top, courtesy Stony Brook School, Stony Brook, N. J. Left, courtesy Ewing Galloway

Whether it is a boy learning chemistry or a seal learning to balance a ball on his nose, the learning process is composed of the same features.

to bake a cake, or in fact any learning activity, the same features will be found. Let us emphasize these features by repetition.

1. The learner must be motivated.
2. There must be a recognized and possible problem.
3. The problem must be attacked with diverse activities.
4. The learner must persist until he is successful.
5. Repetition of the whole learning situation is necessary for selection and fixation.

6. THE MEASUREMENT OF LEARNING

Other important features of the learning process will come to light if we attempt to measure the process itself. In order to measure learning, it is necessary to take some very definite sample of learning that lends itself to expression in numerical quantities. Then we must control and restrict the conditions of the learning. Finally, in order to measure, we must have a measuring stick of some kind. So we arrange a learning situation; arbitrarily decide on some unit, such as a trial or a unit of time, and also a definite measure of achievement, such as speed or accuracy; and record the progress of our subjects in the form of a graph.

Perhaps this can be made more understandable by means of an actual example. Let us suppose that we are going to measure the progress of a subject who is learning to typewrite. We arrange that this subject shall practice typewriting for half an hour at the same time each day, and at the end of the half-hour period we have him copy on the typewriter 500 words. We time him as he does so, and count the errors made in this selection each day. The unit of activity used for the graph will be the daily trial, and the measure of achievement will be either the time taken to type the 500 words or the number of errors made. Let us suppose that this is continued for 50 days. We can then construct a learning curve to picture the progress made by the subject in his learning.

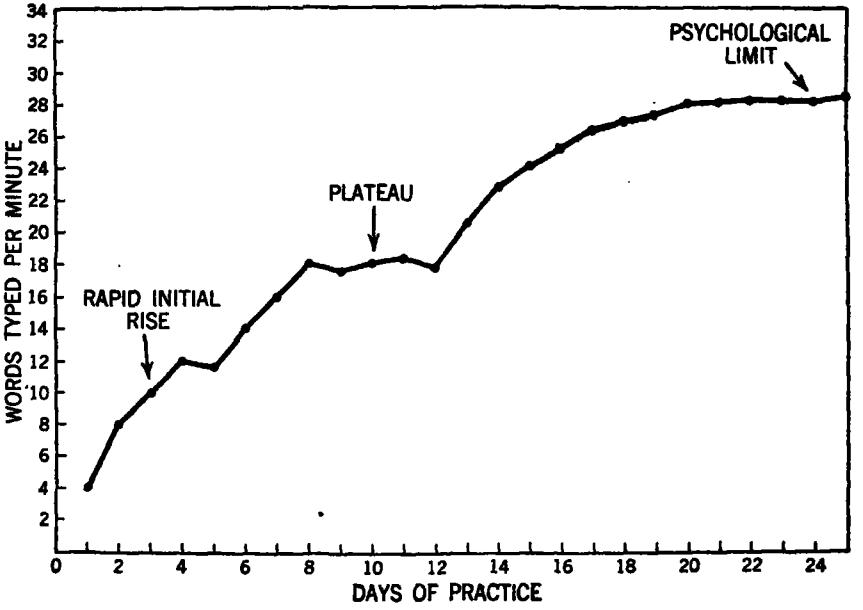
Not all learning curves are the same shape, by any means; but there are certain characteristic features that are common to the majority of such curves, and an outline of these features should further increase our knowledge of the learning process.

a. Most learning curves show an initial rapid rise. Progress is swift on the first few trials. Such a period of rapid progress at the beginning of learning may be due to a combination of various factors. Rarely, if ever, is a learning task started at zero. Rather, we make use of previously learned activities and build on them. In the typing example, the typist had already learned to sit erect in a chair, to manipulate his fingers, to coordinate the movements of his fingers with his visual perceptions, to spell, to form sentences, and so on. In the acquiring of this new activity, these old habits are used and are either combined in new patterns or are the foundation on which further activities are built. This initial spurt in learning may be due to the use of these old habits. Another possible factor is that human beings almost always seem to do the easier parts of a task first. The learner, then, may be acquiring the easier parts of the activity before going on to the more difficult; or, again, it is possible that the zeal and enthusiasm for a new task cause him to throw into the task more than his usual amount of energy.

b. Another characteristic of the majority of learning curves is negative acceleration. By this we mean that the rate of improvement gradually slows down, so that, for instance, the learner makes much more progress between the fifth and tenth trials than he does between the thirty-fifth and fortieth trials. In a complex activity, the easier acts are usually acquired first, and therefore learning gradually slows down in terms of amount of progress in a given unit of time. There are exceptions to this rule, as, for example, in the learning of a foreign language, where the number of new words acquired per unit of time may increase as the words learned make it easier to acquire still other words.

However, the learning curve of any skill, such as typing, telegraphy, skating, and so on, is usually negatively accelerated.

c. All individual learning curves show many irregularities, indicating varying performance from trial to trial. Progress is not by any means smooth or regular. These irregularities



Like most complex learning curves, the one showing progress in learning to typewrite indicates a rapid initial rise; a plateau, or period of no progress; and the psychological limit of improvement, or the limit of improvement possible under present conditions.

may be due to a number of different features, some of which may be mentioned here. Subjective conditions may produce irregularities. Such conditions are differences in motivation, in incentives, in interests, in mood, in attitude, or in any other kind of difference within the individual from trial to trial. Physiological conditions, fatigue, health, lack of sleep, use of drugs, and so on, may be effective also in causing variability of performance from trial to trial. Objective conditions, such as temperature and illumination, may have their effect also. If all these conditions could be rigidly controlled

from trial to trial, the learning curve would probably be smooth and show none of these irregularities. However, this is impossible, and so all learning curves have irregularities.

d. Some learning curves, especially those for complex problems, have what are known as *plateaus*. A plateau in the learning curve represents a period in the learning when there is no measurable progress. Plateaus, although they are not inevitable, are to be expected. A plateau may represent the level of achievement possible with the present method of attack on the problem, and with better methods the plateau may be left behind. A plateau may indicate that the learner is preparing to make a shift from one stage in the learning process to another stage. In learning to send messages by telegraph, the learner usually reaches a point where further progress is impossible unless he learns to send by larger units. He may have been sending in letter units and, in order to achieve more speed, he needs to learn to send the messages in word units. Another cause of plateaus in learning curves is the use of habits that are ill-adapted to the function being learned. In order to make further progress, the individual has to acquire other habits that are better suited to the situation. Plateaus may be caused by fatigue, eye trouble, or other physiological conditions. Plateaus may appear in the learning curve and persist for some time, even when actual progress is being made, but when the progress is not the kind that is being measured by the units of measurement which have been selected. Plateaus may be left behind by increased effort due to increased incentive, by mere persistence, or by the adoption of a better method of attack on the problem. Workers may go on for a long time at a certain level of efficiency, but the introduction of some additional reward may produce a considerable improvement, resulting from the increased effort caused by the increased motivation.

e. There are two kinds of limits that may be seen in learning curves. The first kind we will call the *physiological* limit

of improvement. This is the absolute limit of improvement possible because of the constitution of the nerves and muscles of the individual. This absolute limit is rarely, if ever, reached. Such a limit of improvement is possible in acts of skill that are dependent on quickness and accuracy of movement, but even here very few people reach such a limit in any activity. In complex functions, such as playing the piano, throwing a baseball, and surgery, such a limit is never reached, even after a lifetime of practice; there is always room for further improvement. In acquiring information there is no physiological limit. In the ordinary activities of everyday life, such as writing, reading, shaving, opening envelopes, sorting cards, memorizing, and studying, most people are functioning at a speed and efficiency far below their possible maximum. Learning in such activities is negatively accelerated, so that after the attainment of a certain level of efficiency any further improvement requires a great amount of effort—much more, in fact, than was required earlier in the learning situation. What we usually do is to improve until we have acquired a level of efficiency that is sufficient to get along with. It requires a strong incentive to push people beyond this level.



Courtesy Cushing Academy, Ashburnham, Mass.

In playing certain instruments, throwing a baseball, or performing surgery, the physiological limit is never reached—even after a lifetime of practice.

The second limit we will call the *psychological* limit of improvement. This is the limit of improvement possible with the present conditions of motivation, interest, methods, and other features. It is not by any means the absolute limit that is possible; because, if any of these conditions is radically changed the individual may improve further. So, the psychological limit is really a plateau, because further improvement is possible.

From this study of learning curves, we have seen that learning does not start at zero; that improvement is usually rapid at first and then slows down; that there may be periods of no improvement followed by further progress; and that, although there is an absolute limit of improvement in motor skills, this limit is hardly ever reached. The use of the learning curve to gauge the rate of progress in learning is recommended, because it is a means of arousing and sustaining interest and also a method of measuring progress.

7. FACTORS AFFECTING THE EFFICIENCY OF LEARNING

During the last few years many experiments have been conducted to discover what conditions affect the progress of learning. Much has been found out, but still more awaits further research. In the following paragraphs we will attempt to summarize the factors that have an influence on the speed of learning. These factors will be classified as subjective (having to do with the condition of the learner), related to the material, or depending on methods.

a. Subjective factors.

1. Individual differences. People differ greatly in the ability to learn. If all other factors were constant, we should still find that in any group of individuals the best learner would be several times better than the poorest learner. This great individual variation in learning ability we accept at the present time as being due to inborn differences in capacity,

although in the future it is possible that other reasons will be discovered to explain this fact of individual variation.

2. Age. It was thought at one time that children could learn much more quickly than adults, but we know now that this is not true. Learning ability increases with age up to maturity. The adult can learn more rapidly than the child if he can get rid of the old idea that you can't teach an old dog new tricks. An old dog or a middle-aged man can be taught new tricks quite easily if you can manage to motivate him. The trouble with most middle-aged men or women is not that they are too old to learn, but that they lack the necessary self-confidence as far as learning is concerned, or that they are so complacent that they do not see the need of trying to learn more. The child is characteristically enthusiastic and interested, while the adult is characteristically in a rut. The adult fears social disapproval, because setting out to learn implies that there is something that he does not know, which, of course, is usually a painful admission to make. Or he may be afraid of losing some of his dignity, because we have thought for ages that childhood is the time for learning, and that, if the adult embarks on a voyage of discovery, he is becoming a child again. But age is a very minor factor in anything depending on learning. If he will, the adult can learn just as rapidly as the child.

3. Attitude of the subject. Learning is essentially an active process. As William James said, long ago, "We learn by doing." Learning is aided by active participation. We may learn something by watching others, but trying the activity for ourselves is necessary for rapid and permanent learning. We are helped by observing the professional hit the golf ball, but we can never learn to play golf until we actually take a club in our hands and try to hit the elusive ball for ourselves.

Many thousands of hours are wasted in the schoolroom because the child's interest is not aroused and his active participation secured. It is possible to get the child to learn

facts in geography in which he has no interest by holding out rewards or by threatening punishment; but it is infinitely easier for both the child and the teacher if he is learning something in which he is really interested.

Interest in a subject causes the learner to throw more effort into the task, narrows down his attention, and makes distractions less potent. The speed of learning is directly related to the amount of interest that the learner has in the task.

The intention to learn is essential for efficient learning. To observe a fact is not enough. In order to be remembered, the fact must be observed with intention to remember. If you ask a number of individuals to notice a number of words, to see whether they can spell them, and then later ask them to recall as many of the words as possible, the recall would not be nearly so complete as it would be if you had asked the subjects to attempt to remember the words. In the first case, the learning attitude was not present; while in the second, the subjects would have the intention of learning. Pairs of words were given to a group of individuals to learn, and, after a certain number of repetitions, about 75 per cent could give the second of the pair when the first was mentioned; but only about 7 per cent could give the first of the pair when the second was used as the stimulus. They had learned them in that way; they intended to remember the second of the pair when the first was given but had not the intention of remembering the first when the second was given. The purpose for which anything is learned conditions the remembering or forgetting. When a student learns certain material for a particular purpose, such as an examination at a certain date, forgetting occurs very rapidly after that date. The will to learn is very important. It is the intense effort that educates. We do not remember a person's name, often because we do not make a definite effort to do so. The attentive attitude is necessary for efficient learning. The degree and direction of attention has a great deal to do with the efficiency of the

learning and remembering. Emotional attitudes also have their effects on learning. Moods, feelings of depression or well-being aid or hinder learning, depending on their quality. Throughout all the details mentioned in this section extends the one basic fact that efficient learning depends on an alert, active attitude directed intelligently to the task at hand.

4. Physiological conditions. Efficient learning is dependent on a healthy physical and mental condition, as learning is hindered greatly by fatigue and ill-health. The student who burns the midnight oil could cover the same material much more efficiently in about half the time, the next morning, after a good night's rest.

5. Sex. There seems to be little difference in learning ability between boys and girls. Girls are supposed to be more efficient in language or verbal learning, while boys usually excel in mechanical activities. This difference may not be a native difference, but rather a difference due to the different interests imposed on the different sexes by society.

6. Intelligence. There is a close relationship between learning and intelligence. The more intelligent individual usually learns more quickly than the less intelligent. Learning depends to a considerable extent on the ability to perceive the necessary relationships between the parts of the activity; in other words, understanding material is the first step in learning it. The more meaning we can get into the material or activity, the easier it is to learn and remember it. Intelligence is just this ability to find meaning in situations, to understand; so that it is to be expected that the more intelligent individual should be a more efficient learner than the less intelligent. However, as we saw earlier in our discussion, one of the essential features in learning is persistence. If an individual is persistent enough, he can learn anything, even though he may not be endowed with a very high degree of intelligence. The main difference between the individual of high intelligence and the person with less intelligence is the length of time that each requires to learn things. A few years

ago, it was thought useless to try to teach the feeble-minded anything, but today the children in a hospital for feeble-minded go to school and learn a great deal. True, it may take them longer to learn things than it does other children; but, with sufficient motivation to keep them persisting, they can and do make great progress.

7. Previous practice or transfer of training. Does the learning of one kind of fact aid in the learning of others; or, in other words, is there a transfer of training? This age-old question was first formulated to apply to the educational system as follows: Does the study of a subject such as Latin help the individual to learn other things? That is, is there any value in the formal discipline of study? Of course, there is no definite proved answer to this general question, but there are indications that the learning of one set of facts aids the learning of others only in so far as methods perfected in one situation are carried over to others and made to apply there. Memory systems that attempt to improve the memory by exercises in learning lists of numbers and syllables are just so much waste time, because there is no "faculty" of memory that can be improved by practice. Rather, there are a number of kinds of memory. If the individual would improve his memory for names, for instance, the thing to do is not to practice with lists of numbers or anything else, but to practice remembering names. However, previous practice or established habits, when they can be incorporated into the new activity, are a distinct aid to learning. As has been said previously, no learning process ever starts at zero. Each builds on the foundation of previous learning; but, in order to be used in learning, previous practice must have a real bearing on the present activity.

8. Life bents and dispositions. An individual's learning of any particular subject is often conditioned by habits, life bents, or dispositions formed at some previous time. It is possible to build up almost permanent likes and dislikes for subjects. An unsympathetic teacher may easily cause a child

to dislike such a subject as spelling, so that the learning-to-spell activity is hindered by this dislike to such an extent that the child may have real difficulty in learning to spell, although his ability to do so may be quite normal. Girls are often told that they cannot be expected to be able to do mathematics as well as boys, and this opinion or idea may become fixed, and thus act as a life bent that handicaps their learning of mathematics. One failure in some subject, which may have been due, not to lack of ability but to some other cause, may be sufficient to build up an idea in the mind of the individual that he cannot learn that particular subject, and this disposition produces an attitude that is detrimental to any success in that line of endeavor.

b. Characteristics of the material or activity.

Some kinds of material are more easily learned than other types, and also some skills are acquired with greater facility than others. Material endowed with a high degree of meaningfulness is much more easily learned than less meaningful material. If the material is not in itself meaningful, the learner must endow it with meaning in order to remember it. The same principle applies to motor activities. A new swing in golf is more easily acquired if the reason for the particular movements required is understood by the learner. Blind learning, or learning without understanding, is always inefficient. This is the old distinction between rote and logical learning; and in all experiments bearing on this problem rote learning always comes off second best.

c. Methods of learning.

Just as the mental attitude and the physical and environmental conditions of the individual, as well as the kind of material, play an important part in the speed of learning, so the efficiency of learning is either hindered or assisted by the methods used in the learning situation.

1. Distribution of practice. When we have a long selection

to memorize or a complex skill to acquire, is it more efficient to attempt to do so at one sitting or should the time to be spent on it be divided up into smaller units separated by periods of time? Research on this question has indicated that it is much more economical of effort, besides producing much more permanent retention, if the time spent on learning is divided into units and distributed over a period. Short, intensive learning periods, with intervals of time between them, produce more learning than will the same amount of time massed together.

2. Length of practice periods. If time spent on learning should be distributed, the question arises as to what is the best length of time to engage in learning without a break. The answer to this depends on the kind of learning problem involved; but, in general, short periods are more economical than long periods. It was found that more material was remembered when it was learned in half-hour periods than in 15-minute periods or 45-minute periods or hour periods. The general principle seems to be to allow enough time so that the benefit of warming up or getting into the swing of the thing is not lost, but not long enough so that fatigue and boredom become effective.

3. Whole or part? Whenever possible, the learning of a skill or the memorization of a selection should be as a whole rather than in parts. The main reason why whole learning is more effective than part learning is that the factor of meaning is more operative in whole learning than in part learning.

4. Review. The secret of retention of memories or skills is review. Much is forgotten, but the process of forgetting can be halted or, at least, retarded by carefully spaced reviews. This is true of both verbal and motor learning. Use or review keeps memories fresh and skills efficient.

5. Guidance or tuition. Nothing is ever taught; it must be learned. Although this is true, it does not mean that teaching or tuition is fruitless. Teaching has its place; but teaching, if it is to be of value, is guidance. However, there

must not be too much guidance. We learn by doing. Research on the value of guidance in learning has shown that guidance may not only be useless but actually detrimental to learning if it is too plentiful or if it is introduced too late in the learning process. Information regarding the success or failure of the learner, if he understands that information, is of value; but such information is most effective if it is given near the beginning of learning. We learn by making mistakes, and a certain amount of error seems to be necessary in learning. In order that there may be learning, errors must be comprehended as such. Assistance in the discovery of errors, in the diagnosis of difficulties, and in the redirection of the learner is an aid to learning. One of the best methods of directing the learning of others is through their interests. If we can arrange to get people interested in a task or a subject, then the learning requires very little teaching.

8. HABITS IN EVERYDAY LIVING—ACQUIRING AND BREAKING HABITS

Habits are the foundation and framework of all adult activity. There are many kinds of habits—habits of acting, of thinking, and of feeling. Almost all of our daily activity is composed of habits. A habit is essentially an activity that has been performed often enough to function easily and without much conscious effort; in other words, almost mechanically. Start a habit, and it goes on almost automatically. We don't have to stop and think about it; it is a laborsaving device. In fact, too much attention and thought may throw a habit out of gear. Stop to think about how you tie your shoelaces in the morning, and you will find that thinking about it hindered the habit rather than aided it. The automatic nature of habit is illustrated by the humorous situation in which the author found himself one evening. Before going out, he wished to change his tie. He started this activity and went on thinking about other things. When he "came to," he found that he had undressed himself and

was preparing for bed. The old, habitual activity of undressing had been started by the removal of the necktie and went on further than was desired.

Habits may be good or bad. The great majority of our habits are useful and carry on the day's routine with very little attention or effort on our part. Habit frees the attention for new things. Think how laborious the process of dressing would be tomorrow morning if you had to figure out each item, and how long it would take. Some habits are indispensable; they save time and energy. Other habits are useless or even harmful. Observe anyone in a common setting, such as the dinner table, and you will see that he does many things habitually that have no real value in the process of eating and are not even dictated by etiquette. Nearly everyone has acquired little habits or mannerisms that serve no useful purpose and may even be detrimental. The lecturer fiddling with his glasses, the person who punctuates nearly every remark with "You know what I mean," are examples of such trivial habits—trivial, yes, but often distracting to the listeners.

We are all familiar with the kind of habits usually labeled "bad habits," such as drinking, addiction to drugs, etc. These are serious and are usually very difficult to break. There are also habits that greatly reduce the individual's efficiency, although they are usually accepted by society with no great disapproval. Let us list a few, and the reader can add to the list. There are procrastination, gossiping, wasting time, both one's own and that of others, eating between meals, going into debt, gambling, constant grouchiness, inattention to personal appearance, and thousands of others.

How does one go about getting rid of a habit? How can one unlearn? Habits tend to disappear with disuse. The difficulty comes in starting the disuse of a fixed habit. Habitual action is pleasant, because it is easy; while breaking a habit is difficult and therefore usually unpleasant. Habits

are forms of activity that occur when their stimulus is present and, unless something is done about it, the habit goes on and becomes more firmly fixed. One very useful rule in breaking a habit is the formation of a counterhabit. One must definitely wish to form the counterhabit—wish to do so more strongly than he wishes to continue the present habit. If the habit is grouchiness, it is not enough merely to try to stop being grouchy, because that usually results in emphasizing the condition. The first need is to realize that one has this habit, and the second is to want to stop it; finally, one must substitute some other positive habit in its place. Most people hate to make a radical revolution in their behavior. They become attached to their habitual ways of doing things. The grouchy individual is even attached to his grouchiness. If he wants to be a social success and realizes that such a habit is detrimental to this, he is well along the way to getting rid of the habit. Changes in habits are unpleasant and, to be successful, require rather strong motivation, real desire for change. However, the change can be accomplished. Any habit can be broken.

In influencing others in any line of conduct, such as training, selling, etc., habit must be taken into account. The teacher trying to build up habits of good grammar in children has to combat the grammatical habits acquired already. As the child has for years been saying "It is me," the teacher has not only to teach him to say "It is I," but also to break down the wrong habit of years. The insurance salesman in his task of selling insurance often encounters long-established habits of thought that must be changed before he can be successful in convincing the prospect of the wisdom of the insurance plan. Anything outside the usual routine of life tends to be sidetracked. Old ways are pleasant and new ways are difficult. A routine medical examination, seeing the dentist twice a year, starting a savings account, or buying insurance are usually put off, for they are not habitual activities. It often takes generations of intensive

work to get a nation thinking in new ways or acting differently. There is a habit inertia, which keeps us in the old channels. Here, again, interest is the keynote. If interest can be aroused, action will follow, even if it does not conform to the habitual activity of years.

Habit inertia is very prominent in the thinking of people. Our thinking goes along in much the same way from year to year. Once we have been accustomed to one line of thought, it is very difficult to start out on new voyages of discovery. It is much easier to stay in the rut. New ways are always difficult, not because they are any harder in themselves but because they go against the current of habitual thought. Yet progress in any line of endeavor requires the blazing of new trails. It is easy to get into a rut and stay there. This can be avoided by keeping the mind open to new ideas and by being ready to try out new ways of doing things. We may, through practice, acquire the habit of forming new habits.

Social custom, fashion, or habit is changed very slowly. It has been said that it takes three generations to change a grammatical error, and it certainly required many, many years to bring about changes in people's habits of sanitation. The habits or customs of society help to determine the habits of its members. We follow the crowd. Our whole training is designed to keep us as we are. Because a habit has been the possession of mankind for centuries is no guarantee that it is useful.

Learning is a vast topic to explore. In this chapter we have done no more than introduce it. We may have succeeded in showing that learning is involved in every phase of the activities of the individual. Men are what they are because they have learned to be that way. What has been learned can be unlearned, or at least modified. Learning goes on from birth to death. The individual is continually adjusting to changing situations, and this adjustment leaves its effect. His activity has been modified; he has learned. How an

individual will act in any given situation depends on his motivation; but it depends also on what habits he has acquired, what experiences he has had, and to what stimuli he has learned to respond.

OUTLINE OF THE CHAPTER

Learning

1. Learning defined—the more or less permanent modification of an individual's activity in a given situation resulting from practice in attempts to solve a problem or to achieve a goal.
2. Learning in phylo- and ontogenetic development.
 —increase in learning ability and increase in complexity of nervous system.
 —kinds of things learned by the developing child.
3. Kinds of learning.
 —strengthening of an activity.
 —organization of activities into patterns.
 —isolation of activities from larger patterns.
 —negative adaptation.
 —attachment of a response to a stimulus.
 —reduction of a stimulus for an activity.
4. Verbal learning or memorization.
 —the nature of the process of remembering.
 —retention.
 —recall and recognition.
5. Analysis of the learning process.
 —motivation.
 —problem.
 —attack on problem.
 —persistence until successful.
 —repetition for selection.
 —elimination.
 —fixation.
6. Measurement of learning.
 —characteristics of learning curve—rapid initial rise.
 —negative acceleration.
 —irregularities.
 —plateau.
 —limits.

7. Factors conducive to efficient learning.
 —subjective.
 —individual differences.
 —age.
 —attitude of subject.
 —physiological conditions.
 —sex.
 —intelligence.
 —previous practice.
 —life bents or dispositions
 —material or kind of activity.
 —meaning.
 —length.
 —methods.
 —distribution of practice.
 —length of practice period.
 —whole or part.
 —reviews.
 —guidance.
8. Habits and activity.
 —formation and breaking of habits.
 —habits and social control.

Review Questions

1. Select some common example of learning and make an analysis of it to show the essential features.
2. What are the important features of a "typical" learning curve?
3. Make a complete list of factors affecting the efficiency of learning.
4. Describe the essential features of breaking habits.
5. From the information given in the text construct a list of practical suggestions for the improvement of learning.
6. Indicate the importance of the process of learning in human life.
7. Describe the process of memorization.
8. Show the place of guidance in learning.
9. How would you go about trying to improve your memory for names?
10. Show the force of the various parts of the definition of learning given in the first sentence of the chapter.

Chapter XVIII

THINKING AND IMAGINATION

I. KINDS OF THINKING AND HOW THEY ARE DISTINGUISHED

THINKING, like perceiving and remembering, is a process of knowing; but thinking depends on both perceiving and remembering for its material. The material of thought, which is the product of previous observation, is recalled through the process of remembering. However, thinking can go beyond the barriers of natural phenomena and can include objects and events that never happened and probably never can happen. One can think of fairies, of ghosts, of virtue, and of infinity, and other nonperceptual objects. Nevertheless, these thoughts are the product of actual observations. In general, thinking increases the scope of observation and makes possible adjustments and activities that would be impossible if thinking did not go beyond the bounds of actual perceiving.

There are many kinds of thinking, such as reverie, controlled association, reasoning, conceptual thinking, imagination, daydreams, night dreams, creative thought, and so on. These various kinds of thinking are not separate and distinct, but grade into one another. All thinking makes use of the same kind of material, so that it is not possible to distinguish types of thinking by the objects of thought. It is possible, however, to make distinctions between different thinking activities on the basis of the manner or method in which the material of thought is employed. Thinking may vary in at least two important ways: (1) in the kind and amount of control of the process by the thinking individual, and (2) in the degree of correspondence between the original

experience and the representation of that experience in thought.

Let us take the first variable—degree of control—and try to fit into it various examples of thinking along a scale of degree or amount of control. Daydreaming, night dreaming, reverie are examples of thinking that have a very small amount of control. At the other extreme of this scale is the highly controlled kind of thinking that is characteristic of reasoning and creative invention. Between these extremes are other varieties of thinking, which may be described in terms of the kind and amount of control.

Night dreaming is a type of thinking that has a very small amount of control by the individual. There is practically no criticism or checkup of the process in terms of actual life situations. The ordinary daytime standards of what is probable or right or consistent are in abeyance, and the thought shifts quickly from one scene to another without any logical or rational sequence. Dreams while they last are real. Images and recollections are accepted as having reality, even though they may be extremely incongruous. Dreaming, like all other activities, has a stimulus and is influenced by the physiological condition of the individual.

A great deal of nonsense has been written and spoken about dreams. Most dream interpretations are sheer imagination on the part of the interpreter. Dreams may be wish fulfilling in the sense that the dreamer achieves in his dreams achievements that are denied him in actual living. Or, again, dreams may be unpleasant. The child who has built up vivid fear objects may dream constantly of these, and such dreams may become so vivid as to be called *nightmares*. Freud and the psychoanalysists make a great deal of dreams and have gone to rather extreme lengths in making dreams symbolic of motives, especially motives of a sexual nature. Dreams can be considered as a form of thinking that is less subject to conscious control than are other kinds of thinking.

Daydreaming is another type of thinking that has a small

degree of control. Daydreams usually have a certain amount of control in terms of a connected theme or story or "castle in the air." The individual is usually the hero of his own daydreams. He may make himself the "conquering hero" or the "suffering hero." Such forms of thinking are productive of a certain amount of satisfaction to the dreamer, for in such daydreams all kinds of desires are readily gratified in imagination. One form of daydreaming that does not seem to offer this self-gratification is worry. Worry is a substitute for real action when no real action is possible. Worry daydreaming may become a habit and a substitute for possible action. We occasionally make a kind of game of worry and build up in our daydreaming all kinds of possible calamities. Then, when we discover that no such calamities have occurred, there is a release of tension and a thrill of danger escaped. Normal daydreaming is reserved for the time when no real activity is possible. It is a passing amusement and is promptly forgotten. The difficulty arises when the individual substitutes daydreaming for actual striving. We will have more to say about this in a later section.

Another kind of thinking is reverie, or free association. This is thinking in which one thought calls up another and the train of thought jumps from one thing to another without any conscious control of the process by the individual himself. There must be some reason why one thought calls up another in a reverie, and we find this in previous experiences of the individual. Any one experience may call up any one of a large number of other experiences, and we may summarize the reasons why the particular sequence is followed in the traditional "laws of association." These so-called laws are frequency, recency, intensity or vividness, and emotional congruity. The more frequently an experience has occurred with another experience, the more liable is the one to call up the other. The more recent an experience, the more liable it is to be recalled. The more intense or vivid an experience has been, the more likely it is to be revived in thought.

There is a further condition, which has been called *emotional congruity*. The mood or the emotion present at the time has an influence on the train of free associations.

Most thinking is not so loose and uncontrolled as the kinds already mentioned. There is usually some controlling factor present. The mental set or preparation of the individual controls his process of thought. To take a very simple example, the figures 2 and 7 may produce any one of a number of responses. The individual may think of them as 27 or 9 or 5, etc., depending upon whether he has had the reading set, the adding set, or the subtracting set, or some other. The same thing is true in reading; the context of the word determines what particular meaning is given to it. Another form of control is the objective situation. For instance, words and events in church arouse a different train of thought from that recalled by the same words in other situations.

A problem produces a set that directs the thinking toward a solution. A difficult problem requires considerable search for the solution, and the result may be the kind of thinking that is called *reasoning*, or the type of thought called *creative* or *inventive*. We will consider these two kinds of thinking in more detail in a later section.

The other distinguishing variable is the degree to which a thought is a faithful reproduction of past experiences, or the amount of correspondence between the thought and the actual experience. As with the other variable, we can find types of thought that vary between two extremes. Thought may be extremely faithful in reproducing past experiences. Recollections or memories of past events may be almost perfect reproductions, but usually errors and omissions creep in. In recalling names and telephone numbers, dates, prices, and so on, the memory may be the exact duplicate of the actual fact. This type of thinking is the one extreme in terms of this variable. There is the other extreme, as well, which is usually called *imaginative recall*. In imagination the arrangement of details is very different from actual fact.

True, the materials of the imagination are the recalled facts of previous experience, but the spatial and temporal arrangement differs widely from actual experience. Perhaps the most interesting types of thinking are reasoning and imagination, so we will discuss these in further detail.

2. CHARACTERISTICS OF THE PROCESS OF REASONING

Reasoning is a form of thinking that occurs when the individual is faced with a problem that demands a solution or requires an adjustment. A problem is a situation for which the individual has no ready-made response. In such situations a person may do a number of things: he may deny that it is a problem and do nothing; he may not recognize the situation as being problematic, and again do nothing; or he may recognize the problem and go to work trying one thing after another until he has hit on a solution; or finally, he may reason out a solution. Animals also are faced occasionally with problems, and their behavior in such situations is usually such that it can be called trial and error. They try one thing after another until, finally, if they persist long enough, they will be successful in finding a solution. This kind of adjustment is far from being efficient or economical. The human individual at times uses this kind of adjustment to problematic situations. A person who is trying to solve a mechanical puzzle tries first this way, then that way, and, after a long period of manipulation, he finally solves the puzzle. This is not characteristic of human adjustment. Usually, the trial and error is not so overt or open, but is rather a process of thinking or reasoning.

Reasoning is very like trial-and-error behavior; but, instead of motor exploration, it is mental exploration. It is thus time and effort saving. Reasoning is, therefore, a highly purposeful, controlled, selective thinking process, the material of which is predominantly factual reproductions of past experience. Reasoning and learning are closely related,

both being methods of solving problems, learning usually resulting from the process of reasoning.

The first essential in reasoning is the presence of a problem. Now the problem may be any one of a number of kinds. It may be a practical problem, such as finding one's way about in a strange city, or the method of constructing a boat, or how to find a lost collar button. In such situations, we explore the situation in thought and by observation. We observe facts in the situation, we recall previously learned rules or principles and experiences with similar situations. Some of these we discard as being of no value in the present occasion; others we try out and find to be useless; some we follow through further in thought and discover them not to be applicable; and, finally, we find a real clue and the problem is solved. The directive or controlling influence in the process is the problem.

Another kind of problem that is productive of reasoning is the desire to justify one's actions. This process is usually called *rationalization*. I have work to do, but there is a football game that I want to see. It is an easy matter to find reasons why it would be better to attend the game. I am stale, tired, in need of recreation and fresh air; or it is my duty to support the team of my alma mater. This form of reasoning or rationalization was discussed in Chap. V.

From an early age man asks "Why?" of many of the things that he observes. This is often the starting point of a reasoning process. Why do the wheels go round? Observation and recall of previously learned principles, when put together, give the answer.

The reasoning process may take its start from a general principle or rule and seek applications. We read a book or listen to a lecture in which a general principle is given. We wish to see how this applies, and so we search our memories for examples of such a principle in action. Such a process is a real aid in understanding the principle and also in remembering it.

Related to this last type of problem-motivating reasoning is the presence of doubt. Doubt may stimulate a person to reason out ways in which a statement may not be true. Someone makes a general statement that you doubt, and immediately you search through your memory for instances in which the general proposition does not fit.

Another starting point for reasoning is the desire to verify. Theories in science are the starting points for further search. Darwin stated an hypothesis concerning the mechanism of evolution, and that has served as the starting point for numerous investigations and reasoning processes to verify this theory. Sometimes such theories are refuted in this way and sometimes they are verified. Whatever the result, the theories are valuable in motivating people to further search and thinking along that line.

We have mentioned some of the kinds of problems that motivate reasoning. Now, we need to outline some further characteristics of the reasoning process. When the individual has a problem, he recalls from his past experience facts bearing on this problem and also makes further observations of the present situation. These are the materials of the reasoner. With these he works, rejecting some as not pertinent, combining others in new ways so that new information comes to light. The final result of reasoning is an inference. Recall is essential to reasoning, but reasoning is more than recall; it is the discovery of new facts in those recalled and observed. The world places a heavy premium on such discoveries. The inference or discovery is the solution of the problem that was the starting point of the process. As this process of reasoning is almost a daily occurrence and of real practical importance, it may be worth while to attempt to list those features which go to make a good reasoner.

3. CHARACTERISTICS OF A GOOD REASONER

From the above discussion we may now deduce some of the more important characteristics of the good reasoner.

(*a*) There is the obvious need for facts. If the reasoner is to be successful and the reasoning to be useful, it is necessary that the reasoner have a wide selection of facts to utilize. This implies a wide experience and a facile memory of past experiences. (*b*) The good reasoner needs to perceive accurately what the problem is and needs to keep this problem clearly in mind. The problem serves as a selective agency, determining what facts shall be recalled and what discarded. The problem helps the reasoner to observe pertinent facts in the present situation and to utilize them in the final outcome. (*c*) The good reasoner analyzes the details systematically and not in a haphazard fashion. He attends to pertinent details and attempts to fit them into the complete picture. The details are always handled in a systematic way, so that there is a minimum of fumbling or trial and error. (*d*) The good reasoner avoids inflexibility. He is versatile and does not keep to a single track if that does not lead to a solution. He keeps wide awake to a wide range of possibilities and is open-minded, so that he is not blind to possible avenues of solution. In the solution of a mechanical puzzle, one subject was observed to keep the same unfruitful line of attack for over 10 hours; and, even after he had been shown the correct solution, he went on for over an hour before finally switching from his chosen line of attack to the other. (*e*) The other extreme is also avoided by the good reasoner; that is, the tendency to go off at tangents and not stick to one line of attack long enough really to discover whether it would be successful or not. (*f*) The study of methods of thought as used by others is another aid to the successful reasoner. (*g*) The habit of generalization is, again, an aid to efficient reasoning. This habit of finding in any solution a general principle that may be applied to a wide range of problems may, like all habits, be acquired with practice.

Modern life requires straight thinking, yet straight thinking is very scarce in our day. Very few have acquired the ability of judging, weighing, evaluating, and drawing con-

clusions for themselves. Nearly everyone is prone to accept uncritically the opinion of the editor of his daily newspaper or to adopt without thought the propaganda about politics, economics, or international relations. If, when wars threatened, there were a majority of straight thinkers, there would be no wars. Unfortunately, the majority of people do not reason for themselves in such a crisis but accept blindly and uncritically what they hear and read. The mind of the man in the street is a museum of immature fixations, snap judgments, picked-up prejudices, and unverified hand-medowns of opinion; and yet this same man judges the affairs of the nation, hires the minister, selects governments, and composes them. A careful study of the principles involved in good reasoning and a persistent attempt to put these principles into daily practice would greatly aid us all.

4. THE NATURE OF IMAGINATION

Imagination carries us beyond the realm of personal experience. It is true that the materials of imagination, like all other kinds of thinking, are recalled experiences; but the distinguishing characteristic of imagination consists in the new combinations into which these recalled facts are placed. There is no sharp line between imagination and memory. As we have noted in another connection, in the recall of a past event or experience there are usually elements that do not conform to the original event. A young child makes no very distinct differentiation between past experiences or memories and imaginations. He often gives the product of his imagination as the truth and sometimes is punished for it. The imagination of the child is often so vivid and real that, unless there is definite teaching or guidance, he will be unable to tell the difference between the products of his imagination and the products of his senses. All imagination depends on personal experience. The elements of all imagination must be from actual experience.

This is rather important, because it emphasizes the need for facts and experiences in such a factless thing as imagination. The thinker without facts is like the carpenter without tools. The most productive thinkers are not those who disregard the knowledge, methods, and trials of others but those who are familiar with them. Originality, or creative thinking, is not opposed to the amassing of facts or to the ordinary laws of learning, but is rather dependent on them.

5. CREATIVE OR INVENTIVE IMAGINATION

New combinations of ideas in imagination are essential to the progress of the human race. The highest achievements of man are the result of the development of new combinations of ideas to fit new situations. Invention, or creative thinking, is the process of recombining facts, ideas, and observations in such a way that the result is something that transcends old knowledge; but inventions and creative thinking have to build on old foundations. There is nothing new under the sun except new combinations.

Problems give rise to new ways of thought. Dissatisfaction with present ways of doing things and thinking about things leads to the production of new ideas and new inventions. The perfectly adjusted individual who is completely satisfied with his present activity and ways of thought is not motivated to learn anything new or to reason out new inferences or to create new ways of doing or thinking. The individual who finds a problem in everything and is thus motivated to learn something different or to reason out some new method or to imagine some novel invention is contributing to human progress. The starting point for creative imagination is similar to that for reasoning and learning—a recognized problem.

Imagination is aided by the accumulation of a large body of organized knowledge. Creative imagination is not an inborn characteristic. Rather, it is a habit that can be acquired. New ways of thinking may be learned from others.





Courtesy Caterpillar Tractor Company and The Firestone Tire & Rubber Company

The highest achievements of man come from the use of creative imagination in the development of useful objects to fit actual needs.

There are people who make a habit of mulling over their ideas and getting them into new relations and combinations. When this habit has been acquired, original thinking comes to be as natural as original thinking ever is. When one of these individuals reads a book, he does not stop there, but recalls ideas that he has received from other sources. Comparing the ideas of one author with another, he evaluates what he reads in the light of his own experience and attempts to apply this knowledge to new situations. All this tends toward the production of new combinations of ideas. Creative thinking is comparatively rare, because most people are willing to accept things as they are or as people say they are.

Originality or newness does not guarantee the truth or value of thought. The ravings of an insane patient in a mental hospital, while they may be original enough, may also be utterly valueless. So the new and the original must be put to the same tests as the old and the traditional, the tests of usefulness. One very important essential in creative imagination is, then, criticism or checkup with actual situations. The test is, Does it work? When old ways of thought become inadequate, imagination offers new ways, some of which may fill our needs and some of which may be valueless. Without imagination we should be forced to go on in the same way as our ancestors before us; but, unless there is evaluation of the various products of the imagination and a selection from them of those corresponding to actual needs and facts, imagination would lead to disaster about as often as to advantage.

6. VALUES AND DANGERS OF IMAGINATION

We are ready now to summarize some of the advantages and disadvantages of the imaginative process. Let us look at some of the uses or values of imagination, first. The future is never the same as the past or the present. Man has been able to advance in civilization because of his ability to look into the future and provide for it. Planning or

building in the imagination a picture of possible events and preparing for them is not only an advantage but a necessity. This is one important use of imagination. Discoveries and inventions, also, are the result of the process of imagination. Another sphere of life in which imagination plays a large part is art. It requires imagination both to create art and to enjoy it. The more one can "feel himself into" a picture, a drama, or the plot of a novel, the more he enjoys it.

Imagination must not take the place of real action habitually. The product of imagination should be action. Active adjustment is not always possible and in such cases we usually substitute imaginary action. The child at play would be a warrior and kill his foes, but perhaps for lack of foes or the tools for murder, and also because of social habits that are against killing, he lacks the opportunity of carrying out that impulse. By means of make-believe, however, he is able to be as bloody a warrior as he wishes in his own imagination. The same is true of many who desire great wealth or something else that is impossible of achievement. In such a case, there is a general tendency to engage in day-dreaming and achieve one's successes in that way. Day-dreaming is usually a rather worthless, if not harmful, affair, because it takes the place of real action and striving to achieve actual goals.

Not all daydreaming is equally useless. For instance, a boy wishes to be a great doctor, but he cannot become a doctor of any kind without a long period of preparation. He can, however, and usually does, engage in daydreams about the day when he will actually perform a difficult operation and save a life. This daydreaming may be valuable in keeping the goal before him during the long and tedious course of study; thus his purpose will be kept strong until he actually achieves his dream. In all exercise of imagination the thinker must not lose touch with reality. What is imagined must be based on actual facts and centered around a definite problem. There are unfortunate instances where

the imagination gets disconnected with reality. Daydreams may be an easy way out of the difficulties of life and, if they become too satisfying, they may become dangerous. The daydreams in which we see ourselves reaching some goal may be very useful in keeping our faces set toward that goal and in helping us plan for its achievement; but it is necessary to realize continually that they are only dreams and that hard work alone can turn them into actual experience. Imagination may be either a genuine handicap or a real aid.

7. SOME COMMON CAUSES OF "CROOKED" THINKING

Straight thinking is not only important; it is essential for effective democratic living. Nevertheless, a careful examination of our own thinking or that of other people will show many examples of crooked thinking. Such thinking can be avoided if we know the common sources of error, and some of its causes can be stated simply.

There is, first, the presence of *prejudice*. Prejudice is prejudging—that is, making up one's mind in advance. Wherever there is prejudice there is cloudy thinking. All people have prejudices, but the important thing is to recognize this fact and to recognize the prejudices that we possess so that we can guard against their effect on our thinking. The tendency is for the individual to allow his beliefs and prejudices to color and direct the course of his thinking. For instance, when a man thinks that woman's place is in the home, he is liable to see no good or value in the work of women out of the home, even though there may be plenty of evidence of such value right before his eyes. Straight thinking is impossible when prejudices are present; so, beware of prejudice.

Another cause of crooked thinking is the *wish to believe*. This is very similar to prejudice. The individual decides what he would like to believe and what it would be to his advantage to believe, and then all his thinking is warped

to bring about that result. In this regard, it is a good practice to be wary of any conclusion or belief that gives you too much satisfaction and comfort. Thinking is the manipulation of ideas and facts in order to arrive at some conclusion. When the person has a strong desire to arrive at a particular conclusion, this desire tends to act as a selection agent and only evidence that leads toward that conclusion is brought to mind.

Related to the above two causes of crooked thinking is what we will call *emotional involvement.* This means the presence of some emotion, such as fear, or some sentiment, such as patriotism. When emotions get mixed with thinking, the thinking suffers, as the emotional condition reduces the intellectual or rational element. When he is afraid, the individual is incapable of very accurate thinking; when he is angry, his thinking is liable to be biased and crooked. Whenever strong sentiments enter the picture, an individual is unable to reach logical conclusions.

Suggestion can be a powerful agency in misdirecting the thinking process. When anyone is suggestible, he is ready to accept uncritically and without evaluation whatever he hears or reads from the source to which he is suggestible. For instance, some are suggestible to their favorite newspaper; others may be suggestible to any printed page, so that they are ready to accept anything that they read. Another person may be suggestible in terms of the spoken word when it comes from a particular source—perhaps ready to accept anything that is said from a public platform. Most of us are suggestible to some particular person or type of person. In order to think clearly, an individual needs to beware of the process of suggestion.

Inaccurate or indefinite *use of words* may be the source of crooked thinking. Words are vehicles of thoughts and ideas, but words may be used to cloud thought and obscure ideas. This sometimes happens when someone starts by using a word in a special sense and later gives the same

word a slightly different meaning. Or one may become confused in his thinking by the use of technical terminology that he only partly understands; thus he confuses both himself and his listeners with words that do not convey any precise meaning. Beware of thinking that gets lost in words that have not a clear meaning.

Most crooked thinking is the result of distortion that results from the *selection of data* or facts. It has been said that anything can be proved by statistics. This is true when the selection of the statistics to be quoted is such that only a part of the total picture is given. And what is true of statistics is true of other kinds of data, as well. Thinking can be effective only when the materials of thought are adequate. Peculiar and distorted conclusions result when the thinker uses inadequate and incomplete data.

8. SOME SUGGESTIONS FOR THE IMPROVEMENT OF THINKING

a. Training and practice in thinking can best be obtained in fields where there is no prejudice or emotional involvement.

b. The habit of critical analysis is a useful asset. Be just as critical of your own conclusions and the method of arriving at them as you are of the opinions and conclusions of others. Beware of the process of suggestion, and learn to weigh and evaluate evidence.

c. Beware of the desire to believe. Be ready to scrutinize your conclusions carefully when those conclusions give you too much comfort.

d. Make use of all available checks on the accuracy of thinking, such as syllogisms, graphic representations, etc.

e. Develop the habits of asking questions, keen observation, active relating, verification of information, persistence, and accuracy. These habits aid in straight thinking.

f. Let someone else examine your conclusions and the evidence on which the conclusions are based. If you cannot get agreement from an intelligent, unbiased person, then your conclusion is probably incorrect.

g. Practice looking for inaccuracies in thinking, both in yourself and in others; then find out the source of the inaccuracy, so that it may be avoided in the future.

OUTLINE OF THE CHAPTER

Thinking and Imagination

Kinds of thinking distinguished by—amount and degree of control.
—degree of correspondence with actual reality.

Reasoning—problem—kinds of problems.
—recall of past experiences.
—perception of present situation.
—manipulation of data thus collected.
—inference.

Characteristics of a good reasoner—need of facts.
—keeps problem in mind.
—systematic analysis of details.
—avoids inflexibility.
—avoids distractibility.
—studies methods of others.

Imagination—materials—from past experience.
—combined in new ways.
—creative imagination.
—uses and abuses of imagination.

Common causes of crooked thinking—prejudice.
—the wish to believe.
—emotional involvement.
—suggestion.
—use of words.
—selection of data.

Suggestions for the improvement of thinking.

Review Questions

1. What are the main characteristics of the good reasoner?
2. What do night dreams mean? Can they be interpreted? Do they foretell the future?
3. Is imagination always useless? If not, indicate the value and uses of imagination.

4. List suggestions for the improvement of thinking.
5. Distinguish various types of thinking.
6. What are the fundamentals of the process of reasoning?
7. What are the causes of "crooked" thinking?
8. Show how effective thinking depends on good observation and memory.
9. What are the dangers of daydreaming? Is there any value in daydreaming?
10. Select some examples of thinking from your own experience and practice analyzing them to discover if possible any flaws in the process.

GLOSSARY OF PSYCHOLOGICAL TERMS

The beginner in any science has the difficulty of understanding the technical terms employed. This difficulty is even more acute in psychology, because a number of terms that have a popular, or everyday, meaning have been adopted by psychologists and given restricted, technical significance. In most cases, the meaning of terms is made clear by their context, and in this book the language has been kept as free as possible of obscure words. However, a list of the more common psychological terms will doubtless be found useful to the beginner. Some words not used in the present text are included because it is assumed that the reader will encounter them in other psychological literature. This glossary cannot be made complete as that would require a whole book in itself. For a more complete dictionary of psychological terms the reader is referred to *A Student's Dictionary of Psychological Terms*, by H. B. English.

ability—Potential activity, the power to behave in a certain manner.

abnormal—Deviating from the normal or average. In actual practice the word is reserved for extreme variations.

abstraction—the process of forming general, rather than particular, meanings.

abulia (or aboulia)—Lack of the power to will; no will; abnormal lack of zest for action.

acceleration—Increasing rate of speed. When used as a description of learning curves, negative acceleration means a diminishing rate of progress and positive acceleration an increasing rate.

accessory sensory apparatus—Structures associated with the sense organs, which aid in the efficient reception of sensory impressions.

accommodation—Changes in the shape of the lens of the eye in order to focus objects at different distances.

achromatic—Lacking hue or color.

acoustic—Pertaining to sound waves.

acquired characteristics—Characteristics of activity that have been learned, as contrasted with inherited characteristics.

activity—The subject matter of psychology; anything that the individual does, thinks, or feels.

acuity (sensory)—The ability to discriminate fine differences in stimuli.

adaptation—The process of modifying activity to correspond to a changing environment.

adjustment—The process by means of which the individual responds adequately to varying situations. From the standpoint of mental health, adjustment refers to a happy and socially acceptable response to life situations.

adrenal gland—An endocrine gland situated near the kidneys, involved in emotional behavior.

adrenalin (or adrenin)—The hormone secreted by the adrenal glands.

affective—Pertaining to states of feeling and emotion.

afferent—Pertaining to nerve impulses that are transmitted from sense organs toward the central nervous system or to the nerves conducting these impulses.

afterimage (or aftersensation)—The continuance or reappearance of a sensory experience after the removal of the stimulus. Positive afterimage has the same quality as the original sensation. Negative afterimage is opposite in hue to the original.

age, chronological—Actual calendar age.

age, mental—A measurement of the extent of intellectual development by means of intelligence tests.

age scale—A series of mental tests arranged in age levels according to actual performance of different age groups.

alienist—A specialist in mental disorder who gives evidence in law courts.

Alpha test—A verbal group intelligence test used in the United States Army.

amnesia—An abnormal loss of memory.

analysis—The process of reducing a complex phenomenon to its elements.

anthropology—The study of man, his divisions, races, customs, etc.

apathy—An abnormal lack of feeling and action.

appetite—An organic need or requirement that produces activity tending toward its satisfaction.

aptitude—Capacities presumed to fit an individual possessing them for a particular activity.

ascendance—A personality characteristic indicating a tendency to lead in a social group.

association—Some relation between ideas that tends to connect them in thought.

astrology—A pseudo science that outlines the supposed influence of the stars on human activity.

attitude—A tendency to respond in a certain way; a readiness for a particular kind of behavior.
audition—The power to hear.
auditory—Pertaining to the sense of hearing.
autistic thinking—Thinking remote from reality.
autonomic nervous system—A division of the nervous system controlling the visceral organs.
axon—The long, threadlike part of a neurone.

basilar membrane—A part of the inner ear involved in the process of hearing.
behavior—Muscular and glandular activity of an individual.
behaviorism—The school or division of psychology that discards conscious phenomena from the field of study and concentrates solely on behavior.
Beta test—A nonverbal group intelligence test used in the United States Army.
Binet-Simon scale—A scale of intelligence tests devised by A. Binet and Simon in France, consisting of a large number of small tests arranged in an age scale.
blind spot—The area on the retina of the eye where the optic nerve leaves the eyball, which is insensitive to light.
borderline—Pertaining to an individual who is slightly more intelligent than a feeble-minded individual.
brain center—A part of the brain devoted to the reception of particular kinds of nerve impulses.

capacity—Innate ability.
cell—The structural unit of living bodies.
cell body—A part of a neurone.
central nervous system—That part of the nervous system lying within the spinal column and the skull.
cerebellum—A part of the brain.
cerebrum—The upper part of the brain.
character—The sum total of personality traits of the individual that have a moral significance.
chromatic—Having hue or color.
ciliary muscle—The muscle in the eyeball that controls the focus of the lens.
cochlea—The part of the inner ear that contains the sense organs for hearing.
cognition—The process of acquiring knowledge.
cold spot—The sense organ in the skin for cold sensations.

collateral—The branch of an axon.
color blindness—Inability to distinguish colors. Partial color blindness is the inability to distinguish reds and greens. Total color blindness is the inability to distinguish any colors.
complementary colors—Colors that are opposite to each other on a color circle. Colors which, when mixed on a color wheel, yield sensations of gray, *e.g.*, red and green.
compensation—The process of making up for a deficiency in one activity by striving for proficiency in another.
complex—A constellation of ideas with an emotional tone.
concept—A general idea about anything built up by a number of particular experiences.
conditioned reflex (or response)—An established connection between a stimulus and a response that has been acquired. For example, the stimulus *A* (sight of food) calls forth the flow of saliva; but, when stimulus *B* (ringing of a bell) is repeated a number of times with stimulus *A*, finally stimulus *B* acquires the power of eliciting the response of the flow of saliva.
cones—Sensory cells in the retina of the eye involved in color vision.
conflict—The state of uncertainty when two tendencies to action are antagonistic.
consciousness—The state of awareness.
contrast—Two different visual stimuli in juxtaposition, emphasized.
convergence—The movement of the two eyes so that the light from a single point falls on the area of clearest vision of both eyes.
coordination—The process by means of which the movements of different muscles work together in order to produce an orderly movement.
cornea—The front surface of the eyeball.
cortex—The outer layer of gray matter of the cerebrum.
Corti, organ of—A part of the inner ear intimately connected with the sense of hearing.
covert—Hidden, not directly observable, as applied to an activity.
cutaneous—Pertaining to the skin as a sense organ.

defense mechanism—A kind of behavior that avoids facing a painful or unpleasant situation.
deliberation—The process of comparing alternatives.
delinquency—The violation of legal codes of behavior.
delusion—A belief contrary to reality.

dendrite—The branched part of a neurone.
development—Progressive change in structure or function.
desire—Motivation toward some imagined object.
discrimination—The process of noticing differences in stimuli.
distraction—A stimulus that tends to redirect the attentive response.
distribution curve—A graphical representation of a distribution table.
distribution table—The scores of a group of individuals on some measure, arranged in groups or intervals.
dream—An imaginative experience while in the sleeping state.
ductless glands—Glands that have no canals to take off their secretions, but whose secretions are absorbed by the blood.
dull—A word used to describe an individual whose intelligence is less than average but not extremely so; I.Q. 80 to 90.

effector—Muscle or gland. An organ of behavior.
efferent—Pertaining to nerve impulses conducted from the central nervous system to the effectors, and to the nerves conducting these impulses.
ego—A Latin word meaning I.
emotion—A disturbed state of the organism, involving widespread organic effects and vivid experiences, *e.g.*, fear or anger.
empathy—"Feeling oneself into" a situation.
end brush—The branched process at the end of an axon.
endocrine glands—Ductless glands.
end organs—Receptors and effectors.
environment—Anything external to the receptors that may affect them.
euphoria—Feeling of well-being.
excitation—The process by means of which energy changes in the environment bring about energy changes in bodily organs, such as the receptors.
experience—Any mental state.
exteroceptor—A receptor receiving stimuli from the external world.
extroversion—a personality characteristic indicating that the individual is concerned mostly with events external to himself.

facilitation—Anything which aids excitation or nervous transmission.
fantasy—Daydreaming; imagination that is far from reality.

feeble-minded—A term applied to individuals who are unable to be self-supporting even under favorable circumstances; those whose I.Q. is below 70.
feeling—The affective background of pleasantness or unpleasantness associated with experiences.
formboard—A board with various sizes and shapes of holes into which are fitted blocks, used to test intelligence.
fovea—The area of clearest vision on the retina of the eye.

genetic—Referring to the origin, growth, and development of anything.
genius—An individual possessing a high degree of intelligence; I.Q. over 140.
gland—An organ of the body producing a chemical material that is discharged either to the surface or into the blood stream.
group test—A mental test by means of which a number of individuals are examined at one time.
gustation—The sense of taste.

habit—a learned activity.
hallucination—A false perception; hearing, seeing, etc., something that is not present.
heredity—Features of structure or function handed down from generation to generation in the germ plasm.
hormone—A chemical substance carried in the blood stream that affects a part of the organism remote from its source. The secretions of endocrine glands are called *hormones*.
hue—The color tone of a visual stimulus.
hypnosis—An extreme state of suggestibility.

idea—A revived past experience.
idiot—The lowest class of feeble-minded individual; I.Q. less than 25.
illusion—A grossly erroneous perception.
imagination—A form of thinking in which the spatial or temporal arrangement of ideas does not conform to reality.
imbecile—A feeble-minded individual slightly more intelligent than an idiot; I.Q. between 25 and 50.
impulse (nervous)—An energy disturbance passing along a neurone.
incentive—Some desired object that has become a goal of activity.
inhibition—Some kind of interference stopping or tending to stop an activity.

innate—Inherited, inborn; contrasted to learned or acquired.
insane—A name given to an individual whose mental processes vary greatly from the average.
insight—A comparatively sudden perception of the meaning or significance of any situation.
instinct—An unlearned pattern of behavior.
intelligence—The ability adequately to deal with novel situations.
intelligence quotient (I.Q.)—A measure of the rate of mental development, obtained by dividing the mental age by the chronological age and multiplying by a hundred.
internal secretions—Products from endocrine glands carried by the blood stream.
interoceptor—A receptor receiving stimulation from within the organism.
introspection—The process of examining one's own mental processes.
introversion—A personality characteristic indicating that the individual is concerned mostly with his own mental processes.
iris—A flat muscle that regulates the amount of light entering the eyeball.

kinesthetic sensitivity—Sensations concerned with motion, received from sense organs in the muscles, tendons, and joints.

learning—The more or less permanent modification of an individual's activity in a given situation due to practice in the solution of a problem or in the attainment of a goal.
lens of the eye—A transparent structure in the eyeball that changes shape in order to bring light rays to a focus on the retina.

maturation—Development of structure and function without practice or learning.
maze—An apparatus used to study learning, in which there are blind alleys and pathways leading to a goal.
medulla—Part of the central nervous system between the brain proper and the spinal cord.
memory—A broad term, including the learning, retention, recall, and recognition of experiences.
mental—Referring to the conscious or experienced aspect of human activity.
mental age—A measurement of the extent of intellectual development obtained by means of intelligence tests.

mentally deficient—A term used to describe an individual whose intelligence is considerably below the average.
mental hygiene—A name given to all attempts to prevent mental disorder.
mind—The sum of all mental activity of an individual.
motive—Anything that directs or influences the course of activity.

nerve—A bundle of neurones all conducting the same kind of impulses.
nerve impulse—Energy, probably chemical or electrical, transmitted along nerves.
nervous system—All the neurones in the body.
neurone—A single nerve cell, including the cell body, the axon, the dendrites, and other branches.
nonsense syllable—A combination of letters that can be pronounced but that has no meaning, used in the study of memory.
norm—A standard of comparison.
normal—Approximately average.

objective—Having reference to the external world, in contrast with subjective.
olfactory—Pertaining to the sense of smell.
ontogenetic—Pertaining to the history of the origin and development of the individual.
optic—Pertaining to the eye.
organic—Referring to bodily events and characteristics.
organism—A living plant or animal.
overt behavior—Readily observable behavior.

paradoxical cold sensation—The experience resulting from the stimulation of an end organ for cold by a warm stimulus.
perception—The awareness of objects or events present to the sense organs.
percentile ranking—A method of measurement by means of which the individual is ranked somewhere in a group of a hundred representative individuals.
performance test—A mental test not involving verbal material.
perseveration—The tendency to prolong or sustain an activity.
personality—The sum total of an individual's habits of thought, feeling, and action.
phrenology—The pseudo science of character analysis by means of the shape and proportions of the skull. This method has no foundation of fact.

phylogenetic—Pertaining to the history of the origin and development of characteristics in the race or species.

physiognomy—Character analysis from the appearance of the face. A method that has no factual basis.

physiological limit—The absolute limit of improvement in an activity.

pitch—That characteristic of an auditory sensation by means of which the hearer is able to designate it as high or low.

plateau—A period of no improvement in learning followed by progress; it shows as a flat stretch in the learning curve.

point scale—A series of mental tests in which each test has a definite point value.

practice—Repeated trials in the attempt to solve a problem or perform an activity.

prenatal—Before birth.

projection—The process of attributing one's failures to some thing or person external to oneself.

psychiatry—The study of mental disorders with a view to their cure.

psychoanalysis—The method of studying the mental life of individuals by means of dreams, free association, etc., employed chiefly by Freud and his followers.

psychology—The systematic study of the activities of animals and human beings.

rating—A method of estimating and recording features of character and personality.

rationalization—The process of manufacturing acceptable reasons for actions or beliefs; thinking in which the individual is blind to some of the facts.

reaction time—The time interval between the giving of a stimulus and the response of the subject to the stimulus.

reasoning—The kind of thinking in which the individual infers new facts, forms conclusions, or solves problems.

recall—The process of reviving past experiences.

receptor—A sense organ: a specialized tissue for the reception of stimulation.

recognition—The perception of an object and the awareness that it has been perceived before.

reflex—A simple, unlearned, definite, and immediate response to a stimulus.

response—Activity immediately following stimulation.

retention—The persistence of the effects of learning as shown by recall, recognition, or saving in relearning.

retina—The inner layer of the eyeball, containing the sense organs for vision.
reverie—A type of thinking in which one thought calls up another without much conscious control by the thinker.
rods—Visual sense organs sensitive to brightness but not to color.

saturation—The quality of visual sensations denoting the purity of the color tone.
semicircular canals—The three small tubes in the inner ear containing the sense organs for head position and equilibrium.
sensation—The experienced result of the stimulation of sense organs.
sense organ—A specialized part of the organism involved in the reception of stimulation.
sentiment—A complex, mild, and comparatively permanent emotional condition directed toward some particular object or person.
situation—The totality of the environmental stimuli which are affecting an individual at any given time.
spinal cord—That part of the central nervous system contained within the backbone.
Stanford-Binet test—Terman's revision of the Binet-Simon intelligence tests for use in America.
stereoscope—An instrument by means of which two slightly different pictures are fused so that they are seen as one picture with the added feature of depth, or the third dimension.
stimulation—The effect produced in a sense organ by some energy change adjacent to it.
stimulus—Any energy change that affects a sense organ.
subjective—Pertaining to individual experience; mental; introspectively observable.
suggestion—Ideas, beliefs, etc., that are accepted and acted upon without critical evaluation.
synapse—The place where two or more neurones form a functional connection.

thinking—The awareness of objects and events not present to the sense organs; a succession of thoughts.
timbre—The quality of auditory sensations by means of which their source may be distinguished, depending on the presence of overtones.
trait—A personality characteristic.

viscera—The organs within the abdominal cavity.
vocational guidance—The study of the capacities and aptitudes of the individual in order to aid him in selecting an occupation in which he will have a fair chance of success.

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